MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	St. Thomas College, Ranni					
Faculty/ Discipline	Botany					
Programme	BSc (Hons) Botany					
Course Coordinator	Dr. FRANCIS MATHEW					
Contributors	Dr. Devi Priya M, Associate Prof., Dept. of Botany, St. Thomas College, Ranni					
Course Name	Principles of Organic Farming					
Type of Course	DSE					
Specialization title	Organic Farming and Food Production					
Course Code	MG3DSEBOTA02					
Course Level	200					
Course Summary	The course aims to inculcate the importance of doing organic farming as the responsibility of every human being to ensure food safety, nutritional security and food security for the present as well as future generations. It also envisages to treat organic farming as the basic means to achieve sustainable development for every nation.					
Semester	3	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		4	0	0	0	60
Pre-requisites, if any	A basic understanding of biological sciences would be beneficial					

Course Outcomes (CO)

Number of COs		**5**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To create awareness about organic farming with the concept of sustainability and sustainable development.	K, U	PO1, PO3, PO6
2	To acquaint with the fundamentals of organic farming.	K, U	PO1, PO2, PO6
3	To have the knowledge about the organic certification procedures.	K, U	PO2, PO7, PO8
4	To make aware of quality parameters of organic produce	K, U	PO1, PO2, PO3, PO7
5	To understand the importance of organic farming as an ecologically sustainable means of cultivation of crops to ensure food-security and food safety	K, U	PO1, PO2, PO6, PO8

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	-	3	-	-	3	-	-	-	-
CO 2	3	3	-	-	-	3	-	-	-	-
CO 3	-	3	-	-	-	-	3	3	-	-
CO 4	3	2	3	-	-	-	3	-	-	-
CO 5	3	3	-	-	-	3	-	3	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Organic Farming --Basic concepts			
	1.1	Organic farming – definition – need – scope – principles – characteristics - relevance to modern agriculture.	4	["1", "2"]
	1.2	Different eco friendly farming systems- biological farming, natural farming, regenerative agriculture-permaculture - biodynamic farming	4	["1", "2"]
	1.3	Relevance of organic farming to national and global agriculture and future prospects- advantages - barriers. Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture in India	7	["1", "2"]
2	Soil and nutrients parameters in Organic farming			
	2.1	Soil productivity and fertility. - Crop nutrition - nutrients -classification Nutrient sources: organic manures -fertilizers - biofertilizers .Nutrient recycling through manures and fertilizers	5	["1", "3"]
	2.2	Integrated Nutrient Management. Biological nitrogen fixation : symbiotic and non symbiotic, Organic manures – different types, Green manure crops and cover crops . Organic nutrient sources and their fortification Methods of composting	7	["2", "3"]
	2.3	Bio fertilisers – types, methods of application – benefits and limitations.	3	["2", "3"]
3	Organic Farming - management concepts			
	3.1	Nutrient use in organic farming - scope and limitations. Nutrient management in organic farming. Organic ecosystem and their concepts. Choice of crops and varieties	5	["2", "3"]
	3.2	Fundamentals of pests, disease and weed management under organic mode of production Non chemical pest & disease management - Cultural and biological methods of pest and disease control	5	["3", "4"]
	3.3	Plant derived pesticides - pyrethrum, neem seed kernel extract, neem seed powder, soluble neem formulations, neem oil, tobacco decoction	5	["3", "4"]

Module	Units	Course Description	Hrs	CO No.
4	Organic Farming – Quality Maintenance			
	4.1	Operational structure of NPOP & other agencies for organic production.	4	["4", "5"]
	4.2	Inspection, certification, labelling and accreditation procedures for organic farm products.	4	["4", "5"]
	4.3	Economic feasibility analysis of organic production system Marketing and export potential of organic farm products	7	["4", "5"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Field based collection and interactions, Interactive lectures, flipped classroom, Lecture-based Learning, Project-Based Learning, Experiential Learning, Peer Teaching, invited lecture, Discussion-based Learning, Inquiry-Based Learning, Online Learning, Blended Learning, and other innovative learning approaches.

Assessment Types	**MODE OF ASSESSMENT** Mode of Assessment: Theory **A. Continuous Comprehensive Assessment (CCA)** **• Theory – 30 Marks** Theory/Hands on Work- 30 Marks Involvement and responses in class room transactions Home Assignments Oral presentation/ Viva/Quiz/Open book test Field study, Group discussion on a recent research or review article(<5 years) related to the course Any other method as may be required for specific course / student by the course faculty **B. End Semester Evaluation (ESE)** **• Theory – 70 Marks** Assessment Methods – ESE Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: ∘ PART - A ∘ One or two Sentences - (10 out of 12) – 10 × 2 = 20 ∘ PART - B ∘ Short answer - (8 out of 10) – 8 × 5 = 40 ∘ PART - C ∘ Essays - (1 out of 2) – 1 × 10 = 10

References

- Ananthakrishnan, T.N. (ed.) 1992. Emerging Trends in Biological Control of Phytophagous insects. Oxford & IBH, New Delhi.
- Chhonkar, P.K. and Dwivedi, B.S. 2004. Organic farming and its implications on India's food security. Fertil. News 49(11): 15-18,21-28,31&38.
- Gaur, A.C. 1982. A Manual of Rural Composting. FAO/UNDP Regional Project Document, FAO, Rome
- Howard, A. 1940. An Agricultural Testament. Oxford University, London. Lampin, N. 1990. Organic Farming. Farming Press Books, Ipswitch, U.K.
- Palaniappan, S.P and Anandurai, K. 1999. Organic Farming- Theory and Practice, Scientific Pub., Jodhpur.

Suggested Readings

- Reddy, M.V. (ed.) 1995.Soil organism and Litter decomposition in the Tropics. Oxford &IBH, New Delhi.
- Singh, S.P. (ed.) 1994. Technology for Production of Natural Enemies, Project Directorate of Biological Control, Bangalore.
- Trewavas, A. 2004. A critical assessment of organic farming and food assertions with 9. Trivedi, R.N. 1993. A Text Book of Environmental Sciences, Anmol Pub., New Delhi.

- Veeresh, G.K., Shivashankar, K. and Singlachar, M.A. 1997. Organic Farming and Sustainable Agriculture, Association for Promotion of Organic Farming, Bangalore.

Affidavit

- We, St. Thomas College, Ranni and Dr. FRANCIS MATHEW, agree to permit the use of our proposed course syllabus by other faculty members within the same discipline for course delivery at their respective institutions.
- We, St. Thomas College, Ranni, agree to appoint a new course coordinator for the proposed Organic Farming and Food Production in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, St. Thomas College, Ranni and Dr. FRANCIS MATHEW, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.

MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	St. Thomas College, Ranni					
Faculty/ Discipline	Botany					
Programme	BSc (Hons) Botany					
Course Coordinator	Dr. FRANCIS MATHEW					
Contributors	Dr. Devi Priya M., Associate Prof., Dept. of Botany, St,. Thomas College, Ranni					
Course Name	Organic Plant Protection					
Type of Course	DSE					
Specialization title	Organic Farming and Food Production					
Course Code	MG4DSEBOTA02					
Course Level	200					
Course Summary	The course deals with the principles and practices of growing crops without synthetic pesticides and fertilizers, focusing on sustainable and ecological methods. This includes understanding organic farming concepts, soil health, composting, pest and disease management using natural methods, and crop rotation strategies. The course also explores quality standards for organic produce and marketing aspects					
Semester	4	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		4	0	0	0	60
Pre-requisites, if any	A basic understanding of biological sciences would be beneficial					

Course Outcomes (CO)

Number of COs		**5**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To understand the general characters of major plant diseases	K, U	PO1, PO2, PO3
2	To acquaint with principles of crop disease management	K, U	PO1, PO2, PO6
3	To understand the general characters of weeds and their management	K, U	PO1, PO2, PO3, PO7
4	To familiarize with the symptomatology of plant diseases.	K, U	PO1, PO2, PO3, PO6
5	To develop skill in preparing and using plant protection chemicals and usage of plant protection equipments.	K, U	PO1, PO2, PO3, PO6

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	3	3	-	-	-	-	-	-	-
CO 2	3	3	-	-	-	3	-	-	-	-
CO 3	3	3	3	-	-	-	3	-	-	-
CO 4	3	3	3	-	-	3	-	-	-	-
CO 5	3	3	3	-	-	3	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Introduction to plant pathology			
	1.1	Concept of plant disease- Definition- classification of plant diseases types of diseases based on symptom and pathogen . Plant Pests - algae bacteria, fungi, viruses, viroids, phytoplasmas, ,insects nematodes and higher animals, plant parasites, Basic terminologies in plant pathology - Pathogenicity, pathogenesis, virulence, infection, inoculums, invasion, colonisation, inoculum potential, symptoms, incubation period.	6	["1", "2"]
	1.2	Survival and dispersal of plant pathogens. Phenomenon of infection and pathogenesis Host pathogen interactions - Role of enzymes, toxins, growth regulators and polysaccharides.	4	["1", "2"]
	1.3	Disease cycle, disease syndrome, monocyclic diseases, polycyclic diseases, alternate host, collateral host. Defense mechanism in plants – structural, induced defense in plants. Plant disease epidemiology. Predisposition, physiological race, biotype, symbiosis, mutualism antagonism. Epidemiology of crop diseases - weather factors and their role - temperature, rainfall	5	["1", "2"]
2	Principles of plant disease management:			
	2.1	Importance and general principles of disease management - avoidance - exclusion – protection. Plant Quarantine and Inspection -Rules and Regulations	5	["2", "3"]
	2.2	Plant disease resistance - types of resistance - vertical and horizontal – Structural and Bio- chemical (pre and post- infection) cross-protection.	7	["3", "4"]
	2.3	Integrated plant disease management (IDM) - Concepts, advantages and Importance	3	["4", "5"]

Module	Units	Course Description	Hrs	CO No.
3	Strategies of Plant Disease management			
	3.1	Cultural control : rouging, eradication of alternate and collateral hosts, crop rotation, mixed cropping manure and fertilizer management. Sanitation, hot weather ploughing, soil amendments, time of sowing, seed rate and plant density, irrigation and drainage. spray, post harvest treatment, root feeding etc	6	["1", "2"]
	3.2	Biological control - Role and mechanisms of biocontrol agents and PGPR. Physical Methods - soil solarization, heat treatment etc.	2	["3", "4"]
	3.3	Chemical methods -Fungicides -classification - chemical groups of fungicides - inorganic, organic, systemic, antibiotic etc., Methods of application of fungicides - seed, soil, foliar Learning activity: 1. Prepare a report on the diversity of weeds in your locality with suitable geotagged photos. 2. Preparation of a list of commonly available pesticides in the market. 3. Preparation of organic pesticides – neem decoction, tobacco decoction	7	["4", "5"]
4	Weed Biology and Ecology of Weeds			
	4.1	Introduction, Definitions; harmful and beneficial effects, classification, propagation, dissemination and weed seed dormancy; Critical periods of crop weed competition and allelopathy.	6	["3", "5"]
	4.2	Weed Control - Principles of Weed Management Concepts of weed prevention, control and eradication; Methods of weed management: cultural, mechanical, chemical, biological and biotechnological methods; Integrated weed management.	6	["3", "5"]
	4.3	Herbicides: Definition – advantages and limitation of herbicide usage in India; Herbicide classification, formulations, methods of application; Introduction to Adjuvants and their use in herbicides.	3	["3", "5"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Classroom Procedure (Mode of transaction) Field based collection and interactions, Interactive lectures, flipped classroom, Lecture-based Learning, Project-Based Learning, Experiential Learning, Peer Teaching, invited lecture, Discussion-based Learning, Inquiry-Based Learning, Online Learning, Blended Learning, and other innovative learning approaches.

Assessment Types

MODE OF ASSESSMENT
Mode of Assessment: Theory

A. Continuous Comprehensive Assessment (CCA)
• Theory – 30 Marks
MODE OF ASSESSMENT A. Continuous Comprehensive Assessment (CCA) Theory/Hands on Work- 30 Marks ● Involvement and responses in class room transactions ● Home Assignments ● Oral presentation/ Viva/Quiz/Open book test ● Field study, Group discussion on a recent research or review Article (<5 years) related to the course ● Any other method as may be required for specific course / student by the course faculty

B. End Semester Evaluation (ESE)
• Theory – 70 Marks
Assessment Methods – ESE
Duration of Examination – 2.00 Hrs
Pattern of examination for Theory – Non-MCQ
Different parts of written examination – Part - A , B , C
Answer Type:
◦ PART - A
◦ One or two Sentences - (10 out of 12) – 10 × 2 = 20
◦ PART - B
◦ Short Essays - (8 out of 10) – 8 × 5 = 40
◦ PART - C
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References

- 1. Agrios GN. (2006). Plant Pathology. 5th edition. Academic press, San Diego,
- Lucas JA. (1998). Plant Pathology and Plant Pathogens. 3rd edition. Blackwell Science, Oxford
- 3. Mehrotra RS. (1994). Plant Pathology. Tata McGraw-Hill Limited.
- 4. Rangaswami G. (2005). Diseases of Crop Plants in India. 4th edition. Prentice Hall of India Pvt. Ltd., New Delhi.
- 5. Singh RS. (1998). Plant Diseases Management. 7th edition. Oxford & IBH, New Delhi.

Suggested Readings

- 6. Arun K. Sharma. 2002. A Hand book of organic farming. Agrobios, India. 627p.
- 7. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India. 257p.
- 8. Mukund Joshi and Prabhakarasetty, T.K. 2006. Sustainability through organic farming. Kalyani publishers, New Delhi. 349p.
- 9. Balasubramanian, R., Balakishnan, K and Siva Subramanian, K. 2013. Principles and practices of organic farming. Satish Serial Publishing House. 453p
- 10. Tarafdar, J.C., Tripathi, K.P and Mahesh Kumar, 2009. Organic agriculture. Scientific Publishers, India. 369p.

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Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	St. Thomas College, Ranni					
Faculty/ Discipline	Botany					
Programme	BSc (Hons) Botany					
Course Coordinator	Dr. FRANCIS MATHEW					
Contributors	Dr. Devi Priya M., Associate Prof. , Dept. of Botany, St. Thomas College, Ranni					
Course Name	Organic Crop Production					
Type of Course	DSE					
Specialization title	Organic Farming and Food Production					
Course Code	MG5DSEBOTA02					
Course Level	300					
Course Summary	Organic crop production is an interdisciplinary course that examines the management and optimization of crop production, the science of garden cultivation, and the integration of trees and agriculture in sustainable land management. It explores the principles, techniques, and applications of these fields in the context of modern agricultural practices. Learners will acquire practical knowledge in horticulture and different entrepreneurial skills, which have potential career opportunities in industries and start-ups.					
Semester	5	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		4	0	0	0	60
Pre-requisites, if any	A basic understanding of biological sciences would be beneficial					

Course Outcomes (CO)

Number of COs		**5**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To familiarize with the basics of organic farming	K, U	PO1, PO2, PO3
2	To familiarise with protected commercial cultivation practices of important crops	K, U	PO1, PO2, PO3, PO7
3	Equip students with practical and theoretical knowledge of organic crop cultivation.	K, U	PO1, PO2, PO3, PO7
4	Understand food production systems in the context of sustainability, nutrition, and productivity	K, U	PO1, PO2, PO3, PO7
5	Learn integrated techniques for enhancing productivity naturally.	K, U	PO1, PO2, PO3, PO7

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

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CO 2	3	3	3	-	-	-	3	-	-	-
CO 3	3	3	3	-	-	-	3	-	-	-
CO 4	3	3	3	-	-	-	3	-	-	-
CO 5	3	3	3	-	-	-	3	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Agricultural crops and cropping systems			
	1.1	Agricultural classification of crops, Agronomic classification of crops, Botanical classification of crops, Major farming systems and Cropping Intensity, Methods of sowing/planting - planting geometry and its effect on growth and yield.	7	["1", "2"]
	1.2	Soil- Formation, components, properties, classification (horticultural) of soil Strategies of maintaining soil properties for sustainable agriculture, intercropping, cover cropping, mulching	3	["1", "2"]
	1.3	Irrigation – Scheduling, Methods of irrigation: surface, sub – surface, sprinkler and drip irrigation Organic Farming, Organic Farming (Process) a) Concept of farming system, - Developing organic farms - Important steps & methods Inter cropping, mixed cropping , multi tier cropping	5	["1", "2"]
2	Protected Cultivation of Horticultural Crops			
	2.1	Introduction - scope and importance - problems and prospects of protected culture in India - Plant growing structures - green house - polyhouse - net house - basic considerations in establishment and operation of greenhouses - maintenance .	5	["2", "3"]
	2.2	Type of containers used in protected culture. Substrate -Use of substrate and preparation of substrate for protected cultivation, soil decontamination. Water management- nutrient management	5	["3", "4"]
	2.3	Crop regulation - special horticultural practices in protected cultivation for commercially important crops: vegetable crops, flowering plants, seedlings	5	["4", "5"]
3	Crop Production Practices			
	3.1	Crop propagation: Seed – characteristics of good quality seeds. Factors affecting seed quality, Seed viability testing-Seed germination test and Tetrazolium test. Seed Dormancy-	7	["3", "4"]
	3.2	Vegetative propagation- Cuttings, propagation by specialized plant organs	4	["3", "4"]
	3.3	Vegetative propagation by artificial methods : layering, budding, grafting and micropropagation	4	["2", "3"]

Module	Units	Course Description	Hrs	CO No.
4	Clavation practices of crops			
	4.1	Cultivation of fruit crops – Banana, Mango, Pine apple, Grapes, orange Cultivation of vegetable crops – Tomato, Ladies finger, Amaranthus, Peas and bean Cultivation of tuber crops – tapioca, potato, sweet potao, yams	11	["4", "5"]
	4.2	Genetically modified crops – Advantages and disadvantages, uses,	2	["2", "3"]
	4.3	Harvesting methods - postharvest handling - standards - grading - packing and marketing	2	["4", "5"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Classroom Procedure (Mode of transaction) Field based collection and interactions, Interactive lectures, flipped classroom, Lecture-based Learning, Project-Based Learning, Experiential Learning, Peer Teaching, invited lecture, Discussion-based Learning, Inquiry-Based Learning, Online Learning, Blended Learning, and other innovative learning approaches.

Assessment Types	**MODE OF ASSESSMENT** Mode of Assessment: Theory **A. Continuous Comprehensive Assessment (CCA)** **• Theory – 30 Marks** A. Continuous Comprehensive Assessment (CCA) Theory/Hands on Work- 30 Marks ● Involvement and responses in class room transactions ● Home Assignments ● Oral presentation/ Viva/Quiz/Open book test ● Field study, Group discussion on a recent research or review Article (<5 years) related to the course ● Any other method as may be required for specific course / student by the course faculty **B. End Semester Evaluation (ESE)** **• Theory – 70 Marks** Assessment Methods – ESE Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: ◦ PART - A ◦ One or two Sentences - (10 out of 12) – 10 × 2 = 20 ◦ PART - B ◦ Short Essays - (8 out of 10) – 8 × 5 = 40 ◦ PART - C ◦ Essays - (1 out of 2) – 1 × 10 = 10

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- 2. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India. 257p.
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- 5. Tarafdar, J.C., Tripathi, K.P and Mahesh Kumar, 2009. Organic agriculture. Scientific Publishers, India. 369p.

Suggested Readings

- 6. Tiwari, V.N., Gupta, D.K., Maloo, S.R and Somani, L.L. 2010. Natural, organic, biological, ecological and biodynamic

farming. Agrotech Publishing Academy, Udaipur. 420p.
- 7. Dushyent Gehlot. 2005. Organic farming- standards, accreditation, certification and inspection. Agrobios, India. 357

Affidavit

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Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	St. Thomas College, Ranni					
Faculty/ Discipline	Botany					
Programme	BSc (Hons) Botany					
Course Coordinator	Dr. FRANCIS MATHEW					
Contributors	Dr. Devi Priya M., Associate Prof. Dept. of Botany, St. Thomas College, Ranni					
Course Name	Post-harvest Technology & Value Addition of Organic Plant Produce					
Type of Course	DSE					
Specialization title	Organic Farming and Food Production					
Course Code	MG6DSEBOTA02					
Course Level	300					
Course Summary	The course focuses on minimizing losses and enhancing the value of agricultural produce after harvest through various techniques and processes. It covers topics like post-harvest handling, processing, preservation, packaging, and marketing, with an emphasis on reducing spoilage and maximizing economic returns for farmers					
Semester	6	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		3	0	1	0	75
Pre-requisites, if any	A basic understanding of biological sciences would be beneficial					

Course Outcomes (CO)

Number of COs		**5**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To provide basic understanding / knowledge of postharvest processing methods and processes involved in post harvest loss reduction	K, U	PO1, PO2, PO3, PO6, PO7
2	Develop expertise in postharvest handling techniques to minimize losses and enhance the shelf life	K, U	PO1, PO2, PO3, PO6, PO7
3	To provide basic understanding/knowledge of postharvest processing methods and processes involved in post harvest loss reduction	K, U	PO1, PO2, PO3, PO6, PO7
4	Promote value addition and entrepreneurship in organic food production.	K, U	PO1, PO2, PO3, PO6, PO7
5	Develop entrepreneurial skills including market analysis, business planning and risk management in horticultural industry	K, U	PO1, PO2, PO3, PO6, PO7

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	3	3	-	-	3	3	-	-	-
CO 2	3	3	3	-	-	3	3	-	-	-
CO 3	3	3	3	-	-	3	3	-	-	-
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CO 5	3	3	3	-	-	3	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Post harvest physiology of plant produce			
	1.1	Post harvest physiology – Dormancy – Types of dormancy – Advantages and disadvantages of dormancy - Causes of dormancy – Remedial measures for breaking seed dormancy	5	["1", "2"]
	1.2	Fruit ripening - Climacteric and non climacteric fruits – Metabolic changes during fruit ripening - Hormonal regulation of fruit ripening – Ripening induction and ripening inhibition – Use of hormones in increasing vase life of flowers.	5	["2", "3"]
	1.3	Metabolic changes during seed development - Seed viability and seed vigor - Tests of viability and vigor- Physiological maturity, harvestable maturity- Indices of physiological maturity in crops	5	["1", "2"]
2	Post harvest storage of organic plant produce			
	2.1	Factors affecting post harvest quality Importance of post-harvest management. Postharvest handling methods: Washing, Grading, Waxing. Storage methods: Pre-cooling. Controlled atmospheric storage, Modified atmospheric storage – Low pressure storage and cold chain concept	5	["3", "4"]
	2.2	Packaging of fresh and processed products: general principles and methods of preservation - dehydration, thermal processing, chemical preservatives, fermentation, ionizing, radiation	5	["3", "5"]
	2.3	Importance and scope of processing industry in India. General guidelines for the establishment of small and large scale processing units. Business opportunities, Role of Horticorp and VFPCK	5	["3", "4"]
3	Processing and value addition of organic plant produce			
	3.1	Importance, benefits and impact of value addition Methods of value addition different produce- cereals and millets, Pulses, fruits vegetables, cereals, Processing, packaging, branding, Diversification	5	["4", "5"]
	3.2	Value addition of fruits - Preparation of jams, jellies, squashes, Dry Fruits and Canning. pickles, Syrup, Pulp, Paste, Ketchup	5	["3", "5"]
	3.3	Vegetable-based products: , Vegetable Sauces, Soup salads, syrups and beverages.	5	["4", "5"]

Module	Units	Course Description	Hrs	CO No.
4	Practical			
	4.1	FIELD VISITS TO MODEL ORGANIC FARMS Report preparation on the organic practices following in the farms Practice on making jams, jellies, squashes, pickles, salads, syrups and beverages Visit to agri based industry and prepared visit report Field survey for data collection on the methods of fruits ripening Visit to food processing unit / organic store	30	["2", "3", "4", "5"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Classroom Procedure (Mode of transaction) Field based collection and interactions, Interactive lectures, flipped classroom, Lecture-based Learning, Project-Based Learning, Experiential Learning, Peer Teaching, invited lecture, group discussions, Discussionbased Learning, Inquiry-Based Learning, Online Learning, Blended Learning, and other innovative learning approaches.
Assessment Types	**MODE OF ASSESSMENT** Mode of Assessment: Both **A. Continuous Comprehensive Assessment (CCA)** **• Theory – 25 Marks** Theory: 25 marks ·Involvement and responses in class room transactions ·Home Assignments/preparedness ·Oral presentation/Viva/Quiz/Open book test/written test Field study report /Group discussion on a recent research or review article (≤ 5 years) related the course ·Any other method as may be required for specific course / student by the course faculty **• Practical – 15 Marks** Practical: 15 marks ·Lab involvement and practical skills ·Record/Any other method as may be required for specific course / student by the course faculty **B. End Semester Evaluation (ESE)** **• Theory – 50 Marks** Assessment Methods – ESE Duration of Examination – 1.50 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: ∘ PART - A ∘ One or two Sentences - (10 out of 12) – 10 × 1 = 10 ∘ PART - B ∘ Short Essays - (6 out of 8) – 6 × 5 = 30 ∘ PART - C ∘ Essays - (1 out of 2) – 1 × 10 = 10 **• Practical – 35 Marks** Assessment Methods – Practical based assessments: 30 marks ·Record: 5 marks Duration of Examination – 2.00 Hrs

References

- Taiz, L. and Zeiger, E. 2010. Plant Physiology 5th edition, Sinauer Associates, Sunderland, MA, USA
- Gardner, F.P., Pearce, R.B., and Mitchell, R.L. 1985. Physiology of Crop Plants. Scientific Publishers, Jodhpur.
- Noggle, G.R. and Fritz, G.J., 1983. Introductory Plant Physiology. 2nd Edition. Prentice Hall Publishers, New Jersey, USA
- Sharma, S., & Nautiyal, M. C. (2009). Postharvest Technology of Horticultural Crops. New India Publishing.
- . Mandal, S., Nag, S., & Das, A. (2022). Horticultural Practices and Post-Harvest Technology. Books and Allied Pvt. Ltd.

Suggested Readings

- Prasad, K. (2021). Postharvest Technology of Fruit and Vegetable. Narendra Publishing House.
- Kumar, N. (2021). Introduction to Horticulture (9th ed.). Medtech Science Press.
- Singh, R., & Singh, B. K. (2020). Textbook on Horticulture (1st ed.). New Indian Publishing Agency.
- Kader, A. (2002). Postharvest Technology of Horticultural Crops (3rd ed.). Univ of California Agriculture & Natural Resources

Affidavit

- We, St. Thomas College, Ranni and Dr. FRANCIS MATHEW, agree to permit the use of our proposed course syllabus by other faculty members within the same discipline for course delivery at their respective institutions.
- We, St. Thomas College, Ranni, agree to appoint a new course coordinator for the proposed Organic Farming and Food Production in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, St. Thomas College, Ranni and Dr. FRANCIS MATHEW, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.