



**School of Allied Health Sciences
Open Electives to be offered**

Course code	Course name	Total credits
U25OE011	Food Safety	2
U25OE021	Post-harvest Technology of Fruits & Vegetables	2
U25OE031	Food Quality Management	2
U25OE041	Dairy Science	2
U25OE051	Sea Food	2
U25OE061	Food Laws and Regulations	2
	Total	12



Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U25OE011	Food Safety	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U25OE011	Food Safety	10	--	5	15	40%	35	40%	50

Course Description:

This course will focus on and explore the ideas from viewpoint of knowing and understanding the basics of Indian food product, imparting knowledge about the food processing, This course will focus on to develop the knowledge of students on food safety, its management tools and the laws & standards related to food.

Course Outcomes: after the end of this course students will able to

- CO1** Explain² types of hazards associated with food
- CO2** Explain²knowledge on food regulations (national as well as international)
- CO3** Analyze³the design and implementation of food safety management .
- CO4** Analyze³the design and implementation of ISO series, HACCP and its prerequisites such as GMP, GHP etc.



Course Contents

Module	Unit	Description	Hours
1.0		Introduction to Food Safety	
1	1.1	Introduction to food safety, types of hazards, biological, chemical.	6
	1.2	Physical hazards , Factors affecting Food Safety ,Importance of Safe Foods.	
2.0		Food Safety Management Tools -I	
2	2.1	concept of Food Safety Management Tools - Prerequisites- GHPs, GMPs.	6
	2.2	HACCP- Principles, Pre requisites case studies	
3.0		Food Safety Management Tools-II	
3	3.1	ISO concept and need ,case studies series, TQM - concept and need for quality	6
	3.2	Risk Analysis Accreditation and Auditing Sanitation-Principles and Design Chemicals and Pest management	
4.0		Food born diseases and poisoning	
4	4.1	Food Borne Diseases: Deinition, Classiication - Food borne intoxications & Food borne infections	6
	4.2	Food poisoning: Types of food poisoning, method of investigation of food poisoning, prevention and control- food sanitation, refrigeration, surveillance.	
5.0			
5	5.1	Rules and Regulations of Food Safety: Deinitions - Authorities and Officers.	6
	5.2	Constitution, Functions and Powers –General Provisions as to Articles of Food Indian Food Regulatory ,Global Scenario ,Other laws and standards related to food	

Text Books

- 1 Food Production Operations: Parvinder S Bali , Oxford Publication Prashad Cooking With Indian Masters, J. Inder Singh Kalra .



- 2 A Taste Of India, Madur Jaffery, Great Britain Pavilion Books Ltd.

Reference Books

- 1 Potter.(2007) Food Science CBS Publishers & Distributors,5th Edition.
 - 2 Zaika Ka Safar, Jiggs Kalra Daawat, Jiggs Kalra, New Delhi, Allied Publishers The Professional Chef, Arvind Saraswat, New Delhi, Ubs Publishers
 - 3 Davidar, Ruth N. Indian Food Science: A Health and Nutrition Guide to Traditional Recipes: East West Books, 2001
 - 4 Sen, Colleen Taylor Food Culture in India Greenwood Press, 2005
- Internal Assessment (T1 and FET):
 1. T1 should be based on first two modules for 10 marks each.
 2. Fifth module will be assessed for 5 marks separately it will be taken as seminar.
 - End Semester Examination:
 1. Question paper will comprise of 5 questions, each carrying 7 marks.
 2. The duration of end semester examination shall be 2 hours.
 3. The students need to solve all 5 questions.
 4. Question No.1 will be compulsory and based on entire syllabus.
 5. Remaining question (Q.2 to Q.5) will be selected from all the modules.



Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U25OE021	Post-harvest Technology of Fruits and Vegetables	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U25OE021	Post-harvest Technology of Fruits and Vegetables	10	--	5	15	40%	35	40%	50

Course Description:

This course will focus on and explore the ideas from viewpoint of knowing and understanding the Basics of Post-harvest Technology of Fruits and Vegetables, imparting knowledge about the food processing.

Course Outcomes: after the end of this course students will able to

- CO1** Define¹ post harvest management.
- CO2** Explain² Development stages of fruit and vegetable.
- CO3** Implementing³ different methods of harvesting.
- CO3** Application⁴ different application for fruit and vegetable Industry.

Course Contents

Module	Unit	Description	Hours
1.0		Introduction to Post-harvest Technology of Fruits and Vegetables	
1	1.1	Importance, present status, scope to post harvest management, parts of fruit, botanical classification of fruit and vegetables.	6
	1.2	Nutritional value of fruit and vegetables: water, carbohydrates, protein, lipid, organic acids, vitamin and minerals.	



2.0		Development stages of fruit and vegetable	
2	2.1	Introduction to development stages of fruit and vegetable, respiration	6
	2.2	respiration drift, RQ transpiration Maturity of fruits and vegetables.	
3.0		Changes in ripening	
3	3.1	Changes in ripening of fruit, deterioration of fruits & vegetables	6
	3.2	Primary and secondary causes of losses of fruit and vegetable.	
4.0		Harvesting of fruits & vegetables	
4	4.1	Introduction, definition, different methods of harvesting, postharvest handling	6
	4.2	Post-harvest commodity treatments- pre cooling, waxing, sprout inhibition, disinfestations, fungicide application, hot water treatment, vapor heat treatment, irradiation.	
5.0		Packing house operations	
5	5.1	Introduction, dumping (loading and unloading), washing, drying	6
	5.2	sorting and grading, commodity treatments, packaging, transportation of fruit and vegetable	

Text Books

- 1 A Handbook on Post harvest Management of Fruits and Vegetables P. Jacob John Daya Publishing House, Delhi
- 2 Postharvest: An introduction to the physiology and handling of fruit and vegetables, 6th edition Wills R. and Golding J. UNSW Press

References

1. Post harvest Technology of Fruits and Vegetables – Vol. 1 Verma L. R. and Joshi V. K. Indus Publishing Company, Delhi
2. Potter.(2007) Food Science CBS Publishers & Distributors,5th Edition

● Internal Assessment (T1 and FET):

3. T1 should be based on first two modules for 10 marks each.
4. Fifth module will be assessed for 5 marks separately it will be taken as seminar.



● End Semester Examination:

6. Question paper will comprise of 5 questions, each carrying 7 marks.
7. The duration of end semester examination shall be 2 hours.
8. The students need to solve all 5 questions.
9. Question No.1 will be compulsory and based on entire syllabus.
10. Remaining question (Q.2 to Q.5) will be selected from all the modules.



Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U25OE031	Food Quality Management	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U25OE031	Food Quality Management	10	--	5	15	40%	35	40%	50

Course Contents

Unit No	Content	Hours
Unit I	Food Quality: Parameters of food quality, Subjective and objective methods of quality determination, assessment of	7
Unit II	Food quality-appearance, color, flavor, texture and taste, preparation of score card, panel criteria. Different methods of sensory analysis.	7
Unit III	Food Quality control– Risk management ,Raw material control, processed food control and finished product	7
Unit IV	Standardization systems for quality control of foods National and International standardization system, GMP, GHP. G.L.P,H.A.C.C.P,G.A.P.	8
Unit V	Food Laws- Introduction to Food Laws and Regulations, Need for food standards and their enforcement, various types of laws,Food Safety and Standards Authority of India (FSSAI); Food Safety and Standards Act, 2006 Laws related to food standards and quality control - AGMARK Standards , Codex Alimentary Standards, BIS.	7

Recommended books:

1. Fundamentals of Quality Control for Food Industry Krammer and Twigg Avi Publishing Company, 1966.
2. Quality Control in Food Industry Krammer and Twigg Avi Publishing Company, 1966.
3. Quality Control in Food Industry Herschdoerfer Elsevier, 2012.
4. Sensory Evaluation Techniques Civillie and Carr CRC Press, 2015 5 Handbook of Analysis and Quality Control for Fruit and Vegetable Products. Ranganna S. 2nd Ed. Tata-McGraw-Hill.



- Internal Assessment (T1 and FET):
 5. T1 should be based on first two modules for 10 marks each.
 6. Fifth module will be assessed for 5 marks separately it will be taken as seminar.
- End Semester Examination:
 11. Question paper will comprise of 5 questions, each carrying 7 marks.
 12. The duration of end semester examination shall be 2 hours.
 13. The students need to solve all 5 questions.
 14. Question No.1 will be compulsory and based on entire syllabus.
 15. Remaining question (Q.2 to Q.5) will be selected from all the modules.



Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U25OE041	Dairy Science	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U25OE041	Dairy Science	10	--	5	15	40%	35	40%	50

Unit No	Content	Hours
Unit I	Introduction of dairy industry in India. Scope of dairy industry and present status. Dairy layout for small scale industry and Equipments in the dairy industry.	6
Unit II	Dairy plant sanitization: Basic principles, cleaning in place, types and design of CIP System, agents and methods: bottle and can washing, rotarytype and straight through type, cleaning of tankers and silos, Energy use in Dairy plant - sources and cost of energy, control of energy losses and Energy conservation	7
Unit III	Composition of milk, Physicochemical properties of milk, Factors affecting Composition of milk (Buying, receiving, collection, Transportation of milk, storage and distribution of milk, processing of milk, filtration, clarification, cream separation and heat treatment of milk)	7
Unit IV	Types of milk products. Milk product Processing: Cream, Butter, Khoa, Paneer, Ice-cream, Condensed milk and Evaporated milk. Judging and grading of milk and itsproducts	7



Unit V	Processing of Fermented products: Yoghurt, Curd, acidophilus milk, buttermilk, and Cheddar cheese, Introduction, Manufacturing process, packaging, storage, defects and their prevention Processing of cheese: Introduction, Types, processing, packaging, storage, defects and their prevention WMP and SMP.	7
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Reference Books:

1. De Sukumar - Outlines of Dairy Technology. Oxford Univ. Press. New Delhi.
2. Robinson R. K. - Modern Dairy Technology. Elsevier Applied Science UK.
3. Warner J. M. - Principles of Dairy Processing. Wiley Eastern Ltd. New Delhi.
4. Yarpar W. J. and Hall C. W. - Dairy Technology and Engineering. AVI Westport.
5. Rosenmal I. - Milk and Milk Products. VCH. New York.

● Internal Assessment (T1 and FET):

7. T1 should be based on first two modules for 10 marks each.
8. Fifth module will be assessed for 5 marks separately it will be taken as seminar.

● End Semester Examination:

16. Question paper will comprise of 5 questions, each carrying 7 marks.
17. The duration of end semester examination shall be 2 hours.
18. The students need to solve all 5 questions.
19. Question No.1 will be compulsory and based on entire syllabus.
20. Remaining question (Q.2 to Q.5) will be selected from all the module.