CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: **Master of Technology (Food Technology)**

Semester: **2**

Course Code: **202380203**

Course Title: **Advances in Food Preservation Technology**

Course Group: **Core Course V**

Course Objectives:

1. To understand the need and importance of food preservation.
2. To acquaint with principles of different techniques used in preservation of foods.
3. To acquaint with the novel methodologies applied for food preservation.
4. To assess changes taking place during preservation of foods.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
3	0	2	4	50/20	50/20	25/10	25/10	150/60

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus

Sr.	Contents	Hour
1	Basic concepts of Preservations Scope of food preservation, classification of foods, general principles involved in their preservation and importance of food preservation. Historical developments in food preservation. Overview of different methods of food preservation and new emerging technologies in food preservation.. Factors affecting the stability of foods.	7
2	High Pressure processing Types of equipment, mechanism of microbial inactivation. Effect of HPP on fruit juices, meat products, jam. Ultrasonic processing: Properties of ultrasonic, types of equipment, effect of ultrasonic treatment on microbial inactivation.	5
3	Radiation Source of radiations, mode of action, effect on microorganisms and different radiation dose requirements for preservation of food.	4

4	Microwave heating Microwave and radio frequency, IR drying: Definition, Advantages, mechanism of heat generation, inductive heating in food processing and preservation. Application in food processing: microwave blanching, sterilization and finish drying. Hurdle technology: Types of preservation techniques and their principles, concept of hurdle technology and its application.	**4**
5	Chemical Preservation Preservation of food by use of sugar, salt, chemicals, antibiotics & by smoking. Concentration: Application in food industry processes and equipment for manufacture of various concentrated foods and their keeping quality. Fermentation: Application in preservation of food pickling. curing etc	**5**
6	Preservation by heat Blanching, pasteurization, sterilization and UHT processing. Retort processing of ready to eat (RTE) products. Preservation by drying of foods.	**5**
7	Pulsed Electric Field High intensity light generation system, Application of high intensity light in food preservation, Pulse electric field-mechanism of inactivation, PEF generation system, PEF treatment chambers, Mechanism of ohmic heating and its application, Principle of cold plasma technology and its generation systems and its application.	**5**

List of Practicals / Tutorials:

1	Determination of water activity of food sample.
2	Study of aseptic packaging system
3	Determination of benzoic acid in food samples
4	Estimation of sulphur dioxide in food samples
5	Study of pasteurization process.
6	Study of sterilization process
7	Determination of thermal load during retort processing of foods.
8	Optimization of blanching parameters for foods.
9	To evaluate the shelf life of stuffed paratha under different storage conditions
10	To conduct the accelerated storage study of different foods.
11	Visit of fruits and vegetable canning industry

Reference Books:

1	Dutta AK & Anantheswaran RC.1999. Hand Book of Microwave Technology for Food Applications.
2	Gould GW. 2000. New Methods of Food Preservation. CRC
3	Desrosier NW & James N. (2007). Technology of food preservation. AVI. Publishers
4	Fellows, P.J. (2005). Food processing technology: Principle and Practice. 2nd Ed. CRCPublishers
5	Lai, G., Siddappa, G. and Tondon G.L. 1986. Preservation of Fruits and Vegetables, indian Council of Agril.

Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Industrial/ Field visits
- Course Projects

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks						**R**: Remembering; **U**: Understanding; **A**: Application, **N**: Analyze; **E**: Evaluate; **C**: Create
R	**U**	**A**	**N**	**E**	**C**	
20	25	25	15	10	5	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Provide the knowledge about the basic concepts of food preservation, principles, importance and need of food preservation. It helps in suggesting the application of the preservation process depending on the type of food.	**24**
CO-2	Knowledge about the high pressure processing and other novel methods of food preservation helps in understanding the basic concepts and principle involved in food preservation to inactivate the microorganism.	**22**
CO-3	Knowledge of radiation, chemical preservatives and PEF helps in understanding the different modes of application in preservation of foods and its effect on microorganism as well as quality of food. It also provides the knowledge of lethal dose for different foods	**21**
CO-4	Choose the appropriate application of certain conservation processes with regard to the preservation of quality and the satisfactory durability	**17**
CO-5	Optimize process parameters for selected conservation processes taking into account the physico-chemical properties of food products	**16**

Curriculum Revision:	
Version:	2.0
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025