DISCIPLINE SPECIFIC CORE COURSE – GE-2-FT: FRUIT AND VEGETABLE PRESERVATION TECHNOLOGY

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Fruit and Vegetable Preservation Technology	4	3	0	1	Class XII	NIL

LEARNING OBJECTIVES:

9. To introduce students to the myriad field of preservation
10. To help students understand the basic principles of fruit and vegetable preservation
11. To help students learn methods and gain skills required for preserving fruits and vegetables
12. To know the regulatory and safety aspects associated with processing preserved products

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

12. Explain the principles and methods of preserving fruits and vegetables
13. Appreciate the role of food safety regulations in preservation industry
14. Prepare different types of preserved products from fruits and vegetables

SYLLABUS OF GE-2-FT

THEORY
(Credits 3: 45 Hours)

UNIT I: Unit I: Fruit and Vegetable Preservation – an overview (10 Hours)

- *Unit Description:* This unit will introduce the students to the vast field of food preservation and the salient changes which occur post harvest in fruits and vegetables.

- *Subtopics:*
  - Objectives of preservation and processing
  - Scope of preservation industry in India
  - Physical, chemical and microbiological changes in fruits and vegetables
  - Factors affecting growth of microorganisms and the control measures

UNIT II: Principles and methods of preservation (12 Hours)

- *Unit Description:* This unit will explain to the students the principle, advantages and disadvantages of various methods of preservation.

- *Subtopics:*
  - Asepsis
  - Low temperature
  - High temperature
  - Removal of moisture
  - Removal of air
  - Use of chemical preservatives
  - Fermentation
  - Irradiation
  - Newer methods

UNIT III: Fruit and vegetable processing (15 Hours)

- *Unit Description:* This unit will help students learn in detail the methods of preparing safe and good quality preserved products.

- *Subtopics:*
  - Chutney and sauces- Definition, method of preservation, steps in preparation of chutney and sauces.
  - Fruits beverages- Definition and classification, method of preservation (with special emphasis on pasteurization, use of chemical preservatives, sugar), role of various ingredients.
  - Jam, Jelly and Marmalade-definition, role of pectin and theory of gel formation, method of preservation, steps of preparation, evaluation.
  - Preserves- definition, method of preservation, steps of preservation, evaluation, candied, crystallized and glazed fruits
  - Pickles- definition, classification method of preservation steps of preparation of vinegar pickles, evaluation.

Unit IV: Food Safety Regulations and procedures (8 Hours)

- *Unit Description:* This unit will help students learn about the regulatory aspects of preserved food products. The unit will also briefly discuss the practices and programmes which can be adopted to enhance quality of preserved products.

- *Subtopics:*
  - Key terms, factors affecting food safety, recent concerns
  - National food law (FSSA), standards and regulations
  - Food additives and contaminants
  - Good Hygiene Practices
  - HACCP

PRACTICAL
(Credits 1: 30 Hours)

Preparation, packaging, labeling, sensory and objective (TSS, p^H) evaluation of :

1. Sauces and chutnies
2. Ketchup (tomato)
3. Squashes (lemon squash, orange squash, pineapple squash)
4. Syrups (rose syrup and almond syrup)
5. Jams (apple jam and mixed fruits jam)
6. Pickles (green chilli, lemon, mixed vegetable)
7. Preserve (carrot)

ESSENTIAL READINGS (Theory and Practical):

- Rao, E.S., Garg, M. and Barwa, M.S. (2023). *Handbook on Processing and Preservation of Fruits and Vegetables.* 2nd edn. Variety Books Publisher's Distributors, New Delhi
- Frazier, W.C. and Westhoff, D.C. (2014). *Food Microbiology.* Chennai: Tata McGraw Hill Publishing Company Limited.
- Fellows, P.J. (2022). *Food Processing Technology Principles and Practice*. 5th edn. Woodhead Publishing Series in Food Science, Technology and Nutrition. https://doi.org/10.1016/C2019-0-04416-0.
- Rahman, M.S. (Ed.). (2020). *Handbook of Food Preservation.* 3rd edn. CRC Press. https://doi.org/10.1201/9780429091483
- Suri, S. & Malhotra, A. (2014). Food Science Nutrition and Safety. Delhi: Pearson India Ltd.
- Sivasankar, B. (2002). *Food Quality, in Food Processing and Preservation.* Prentice-Hall of India Private Limited, New Delhi.
- Srivastava, S.S. (2006). *Phal Parirakshan.* Lucknow: Kitab Mahal.

SUGGESTED READINGS:

- Potter, N.N., and Hotchkiss, J.H. (2012). *Food Science.* 5th edn. Springer New York, NY. XV, 608. https://doi.org/10.1007/978-1-4615-4985-7.
- Lal, G., Siddhapa, G.S. and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables.* New Delhi: Indian Council of Agriculture Research.
- Subbalakshmi, G., and Udipi, S.A. (2007). *Food Processing and Preservation.* Delhi: New Age International Publishers.
- Khurdia, D.S. (1995). *Preservation of fruits and vegetables.* New Delhi: Indian Council of Agriculture Research.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.