

**B.A. (Prog.) with Food Technology (FT) as Non-Major  
Category-III**

**DISCIPLINE SPECIFIC CORE – DSC-12-FT:  
ADVANCED 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		
Advanced Preservation Technology	4	3	0	1	Class XII Pass	Basic Preservation Technology

**LEARNING OBJECTIVES:**

1. To impart knowledge about advanced preservation techniques such as dehydration, canning and freezing.
2. To equip the students with knowledge and skills for preparing, packaging, evaluating and marketing of preserved pectin products and preserves.

**COURSE OUTCOMES:**

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

1. Describe the different principles and methods of fruit and vegetable preservation and processing.
2. Compare different advanced preservation techniques such as dehydration, concentration, refrigeration and freezing.
3. Describe the various steps in dehydration, freezing, canning, pectin products and preserves.
4. Prepare, evaluate, package and market jams, jelly, marmalade, and preserves professionally.

**SYLLABUS OF DSC-12-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Canning/ Hermetic Preservation (10 Hours)**

- *Unit Description:* This unit will focus on the purpose of preservation via canning/hermetic sealing and packaging which is termed as the father of preservation.
- *Subtopics:*
  - Definition and objectives of canning
  - Principle of Preservation, steps of canning of fruits and vegetables (with special emphasis on blanching, exhausting and heat processing)
  - Spoilage of canned foods
  - Packaging

**UNIT II: Refrigeration and Freezing (9 Hours)**

- *Unit Description:* This unit will focus on the technique of Freezing and Refrigeration as a means of Preservation.

- *Subtopics:*
  - Definition and objectives of Refrigeration and Freezing
  - Principles of Refrigeration and Freezing
  - Methodology of Refrigeration and Freezing of fruits and vegetables
  - Cryogenic Freezing
  - Evaluation of Refrigerated and Frozen foods
  - Cold Storage and Cellars

### **UNIT III: Dehydration**

**(8 Hours)**

- *Unit Description:* This unit will focus on the technique of dehydration and concentration as a means of preservation.
- *Subtopics:*
  - Dehydration- definition and objectives
  - Method of preservation, normal drying curve, water activity, factors affecting rate of drying,
  - Sun drying,
  - Types of dehydration techniques and steps involved.
  - Concentration- definition and objectives, techniques
  - Rehydration

### **UNIT IV: Fruit and Vegetable Processing –Pectin Products, and Preserves**

**(18 Hours)**

- *Unit Description:* This unit will focus on the processing of jam, jelly, marmalades, preserves and pickles.
- *Subtopics:*
  - Jam, Jelly and Marmalade- definition, role of pectin and theory of gel formation
  - Method of preservation, steps of preparation and evaluation of jam, jelly and marmalade
  - Preserves- definition of candied, crystallized and glazed fruits.
  - Principle of preservation, steps of preparation and evaluation of candied, crystallized and glazed fruits.

### **PRACTICAL** **(Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

Preparation, packaging, labelling, sensory/objective (TSS, pH and headspace) evaluation and costing of:

1. Jam (apple jam and mixed fruit jam)
2. Jelly (guava jelly)
3. Marmalade (orange marmalade)
4. Preserve (carrot)
5. Dehydration of vegetables (green leafy vegetables, other vegetables and tubers)
6. Rehydration of dehydrated vegetables
7. Freezing of vegetables
8. Preparing any of the preserved product/new product in bulk and organizing an exhibition-cum-sale.

### 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
- Potter, N., and Hotchkiss, J.H. (2006). *Food Science*. Delhi: CBS Publishers.
- Lal, G., Siddhapa, G.S., and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.
- Barba, F. J., Ahrné, L., Xanthakis, E., Landerslev, M. G., and Orlien, V. (2018). Innovative technologies for food preservation. In: *Innovative Technologies for Food Preservation* (pp. 25-51). Academic Press.
- Board, N. P. C. S. (2012). *Modern Technology on Food Preservation*. Asia Pacific Business Press Inc.
- Goyal, MR., Mishra, S.K., and Birwal, P. (2022). *Food Processing and Preservation Technologies – advances, methods and applications*. New York: Apple Academic Press.

### SUGGESTED READINGS:

- Khurdia, D.S. (1995). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Hui, Y.H., and Evaranuz, E.O. (2015). *Handbook of Vegetable Processing and Preservation*. 2nd Edition. USA: CRC Press.
- Sharma, S. (2010). *Postharvest Management and Processing of Fruits and Vegetables: Instant Notes*. New India Publishing Agency.
- Ramaswamy, H. and Marcotte, M. (2009). *Food Processing–Principles and Applications*. Boca Raton: Taylor and Francis.
- Srilakshmi, B. (2018). *Food Science*. Seventh Edition. Delhi: New Age Publications.
- Subbalakshmi, G. and Udipi, S.A. (2007). *Food Processing and Preservation*. Delhi: New Age International Publishers.

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