

**DEPARTMENT OF HOME SCIENCE**  
**Semester -V**

**B.A (PROG) WITH FOOD TECHNOLOGY (FT)**

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

**DISCIPLINE SPECIFIC CORE – DSC-9-FT:  
FOOD PROCESSING: TECHNIQUES AND TECHNOLOGIES**

**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		
Food Processing: Techniques and Technologies	4	2	0	2	Class XII	NIL

**LEARNING OBJECTIVES:**

4. To impart theoretical and practical knowledge on basic concepts of salient techniques and technologies used in the food processing industry.
5. To familiarize the students regarding the importance of process control for ensuring efficient application of various techniques/technologies.

**LEARNING OUTCOMES:**

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

5. Appreciate the significance of using most appropriate pre-preparation and preparation techniques/technologies for processing a food product
6. Develop analytical skills pertaining to application of food processing techniques and technologies in the industry
7. Train staff associated with food handling at various levels
8. Work in food sector such as food manufacturing, packaging, sale and distribution units at mid-level positions

**SYLLABUS OF DSC-9-FT**

**THEORY**  
**(Credits 2: 30 Hours)**

**UNIT I: Introduction to material handling and pre-preparation techniques (7 Hours)**

- *Unit Description:* This unit will briefly discuss several pre-preparation techniques used in the food

industry.

- *Subtopics:*
  - Material handling during receiving and storage.
  - Cleaning of food and equipment's (dry, wet, others)
  - Separating, grading, sorting
  - Mixing, blending, binding, beating, whipping, folding, mashing, stuffing.
  - Disintegrating and grinding
  - Bleeding, singeing, flaying, trussing, de-scaling, skinning, ageing, curing, filleting.
  - Pumping, filtration, centrifugation
  - Other pre-preparation techniques: cutting, grating, peeling, stringing, soaking,

## **UNIT II: Food Processing Techniques and Technology**

**(16 Hours)**

- *Unit Description:* High temperature is popularly used while processing a variety of foods. This unit will discuss the principle, advantages, disadvantages and salient techniques, machinery required for processing food using high/low temperature, fermentation and irradiation.
- *Subtopics:*
  - High Temperature: principle (TDT, cold point), advantages, disadvantages, salient heat treatments employed in processing food (<100C, ~100C, >100C), process and heating systems – use of heat before and after packaging, ultra high-pressure systems (autoclaves, steamers and heat exchangers), canning
    - Dehydration: principle (heat mass transfer,  $a_w$ , drying curve), advantages, disadvantages, treatment of foods before and after drying, techniques (heated air/heated surface dehydrators), methods of dehydration
    - Concentration: principle, advantages, disadvantages, methods (any five)
    - Extrusion: principle, advantages, disadvantages, methods (hot paste, cold paste), extruders.
  - Low temperature: principle, advantages, disadvantages, process – treatment of foods before, during and after refrigeration/freezing, types (common or cellar storage, chilling or cold storage), types of freezing (direct and indirect contact)
  - Fermentation: principle, advantages, disadvantages, production of culture, maintaining activity of cultures, products obtained from fermentation (food products, nutrients, enzymes)
  - Irradiation: principle, advantages, disadvantages, general process

## **Unit III: Process Control and Post processing Techniques /Technologies**

**(7 Hours)**

- *Unit Description:* Process control is being recognized as an important component for enhancing efficiency and quality in food processing. This unit will discuss the significance and scope of process control as well as about packaging, storing, distribution. It will also help students learn about recent advancements in the field of food processing and packaging.
- *Subtopics:*
  - Process control – role of automation
  - Packaging techniques and technologies: passive, active, intelligent, general packaging process (assembly line)
  - Storing, distribution

- Recent advancements in food processing and packaging

**PRACTICAL**  
**(Credits 2: 60 Hours)**

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

10. Learn skill (hands on experience) on various pre-preparation techniques.
11. Study/ compare quality characteristics of foods processed by using high temperature, low temperature, fermentation, irradiation or combination methods.
12. Cut-out analysis of canned food(s)
13. Survey on convenience foods available in nearby local market and identification of processing techniques used in manufacturing them.
14. Learn skill of developing food product(s) using low temperature and/or fermentation as principal method of processing and their packaging.
15. Learn skill of developing food product(s) using low temperature and/or fermentation as principal method of processing and their packaging.
16. Presentation on case study of any one processing technique or technology used traditionally in any food sector or any food industry.
17. Presentation/demonstration on innovative food processing technique or technology of a food ingredient (eg; peeling/extrusion equipment, novel technologies).  
OR  
Prepare an educational audio-visual aid on recent trends in food processing industry.
18. Industry visit(s)  
OR  
Train a group of women/students/canteen workers about any one food processing technique through demonstration of any food product that can be followed at home-based level.

**ESSENTIAL READINGS (Theory and Practical):**

- Fellows, P.J. (2022). *Food Processing Technology Principles and Practice* (5th ed.). Woodhead Publishing Series in Food Science, Technology and Nutrition. ISBN: 9780323857376. <https://doi.org/10.1016/C2019-0-04416-0>.
- Rahman, M.S. (Ed.). (2020). *Handbook of Food Preservation* (3rd ed.). CRC Press. <https://doi.org/10.1201/9780429091483>
- Sharif, Z., Mustapha, F., Jai, J., Mohd Yusof, N., and Zaki, N. (2017). Review on methods for preservation and natural preservatives for extending the food longevity. *Chemical Engineering Research Bulletin*, 19, 145–153. <https://doi.org/10.3329/cerb.v19i0.33809>
- Suri, S., and Malhotra, A. (2014). *Food Science Nutrition and Safety*. Delhi: Pearson India Ltd.
- Potter, N.N., and Hotchkiss, J.H. (2012). *Food Science* (5<sup>th</sup>ed.). Springer New York, NY.XV, 608.<https://doi.org/10.1007/978-1-4615-4985-7>.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.
- Sivasankar, B. (2002) *Food Quality, in Food Processing and Preservation*. Prentice-Hall of India Private Limited, New Delhi.

## SUGGESTED READINGS:

- Alyward, F.E. (1999). *Food Technology Processing and Laboratory Control*. Allied Scientific Publishers.
- Bali, P.S. (2009). *Food: Production Operations*. First Edition. Oxford University Press.
- Clark, S., Jung, S. & Buddhi. (2022). *Food Processing: Principles and Applications*. First Edition. John Wiley and Sons Inc.
- Geoffrey, C.P. (2009). *Food Science and Technology*. First Edition. Willey-Blackwell.
- Green, J.H. (2009). *Food Processing Industries*. AVI Press.
- Kumar, A. (2019). Food Preservation: Traditional and Modern Techniques. *Acta Scientifc Nutritional Health* 3(12) : 45-49
- Murano, P.S. (2003). *Understanding Food Science and Technology*. First Edition. Thomsons Pvt. Ltd.
- Prasad, J. (2022). खाद्य प्रसंस्करण और सुरक्षा विषय. First Edition. Kalyani Publishers.
- Singh, M.K. (2007). *Food Processing*. First Edition. Discovery Publishing House.
- Singh, N. & Singh, I.S. (2018). *Food Science and Technology*. First Edition. Woodhead Publishing House.

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

### DISCIPLINE SPECIFIC CORE – DSC-10-FT: ADVANCED BAKING 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 Baking Technology	4	2	0	2	Class XII	Basic Baking Technology

## LEARNING OBJECTIVES:

1. To impart students with knowledge related to processing of breads and Cookies.
2. To familiarize them with basics of food packaging, marketing, and cost control.

## LEARNING OUTCOMES:

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

1. Skill to prepare various kinds of breads and cookies
2. Illustrate various methods of marketing
3. Compare food packaging materials and their characteristics

4. Prepare food labels and conduct sensory evaluation of prepared baked products
5. Entrepreneurial skill related to bakery products

## **SYLLABUS OF DSE-10-FT**

### **THEORY (Credits 2: 30 Hours)**

#### **UNIT I: Bread Processing (13 Hours)**

- *Unit Description:* This unit describes bread processing and various spoilage occurring in bread and different bread products.
- *Subtopics:*
  - Preparation of bread - Ingredients, methods of bread dough preparation (straight, sponge, salt delayed, sour dough) steps in bread processing, evaluation of the baked bread.
  - Staling of bread, spoilage in bread and control measures.
  - Types of breads (variety of breads, pizza base, buns, dinner rolls, sourdough products).

#### **UNIT II: Cookies, Biscuits and Crackers Processing (05 Hours)**

- *Unit Description:* The unit will focus on processing and evaluation of cookies and crackers. It also describes the packaging, storage & labelling of the processed products.
- *Subtopics:*  
Ingredients, types, processing, storage and evaluation.
  - Cookies (Sheet, molded and dropped).
  - Biscuits
  - Crackers.

#### **UNIT III: Food Packaging, Marketing and Cost Control (12 Hours)**

- *Unit Description:* This unit describes the FSSAI regulations for food packaging, various food packaging materials, food marketing and cost calculation for processed baked food products.
- *Subtopics:*
  - Packaging – its importance, essential features of an ideal package, food packaging materials for baked products.
  - Food Safety and Standard (Packaging) Regulation, 2018, Food Safety and Standard (Labelling and Display) Regulation, 2020.
  - Marketing - definition and importance, marketing strategies (wholesale, retail, digital, swot and market mix) understanding the difference between marketing and sales, 4Ps of marketing (Product, Price, Place, Promotion) and distribution.
  - Cost control – cost components (material cost, labour cost and miscellaneous costs).

### **PRACTICAL (Credits 2: 60 Hours)**

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

1. Determination of gluten content in refined wheat flour.

2. Determination of dough raising capacity (DRC) of yeast and factors affecting the yeast activity.
3. Designing labels for baked products.
4. Preparation and sensory evaluation, packaging and costing of breads:
  - White and brown bread
  - Buns
  - Dinner rolls
  - Pizza base
5. Preparation and sensory evaluation, packaging and costing of cookies:
  - Dropped cookies
  - Rolled cookies
  - Molded cookies
6. Preparing any of the baked products in bulk and organizing an exhibition-cum sale.

### ESSENTIAL READINGS (Theory and Practical):

- Dubey S. C. (2016). *Basic Baking: Science and Craft*. Delhi: The Society of Indian Bakers.
- Dubey S. C. (2009). *Bakery Vigyan*. Delhi: The Society of Indian Bakers.
- Matz A. (2008). *Bakery Technology and Engineering*. 10<sup>th</sup> Edition. Delhi: CBS Publishers.
- Kirar, I. (2021). *Textbook of Culinary and Bakery World*, I K International Publishing House Pvt Ltd.
- *Food Safety and Standards Authority of India*: <http://www.fssai.gov.in>(accessed on 17.3.2023)
- Sethi, M. (2005). *Institutional Food Management*. Delhi: New Age International Publishers.
- Food Safety and Standard (Labeling and Display) Regulation, 2020 [https://www.fssai.gov.in/upload/notifications/2020/12/5fd87c6a0f6adGazette\\_Notification\\_Labeling\\_Display\\_14\\_12\\_2020.pdf](https://www.fssai.gov.in/upload/notifications/2020/12/5fd87c6a0f6adGazette_Notification_Labeling_Display_14_12_2020.pdf) (accessed on 17.3.2023)
- Food Safety and Standard (Packaging) Regulation, 2018 [https://www.fssai.gov.in/upload/uploadfiles/files/Gazette\\_Notification\\_Packaging\\_03\\_01\\_2019.pdf](https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_Packaging_03_01_2019.pdf) (accessed on 17.3.2023)

### SUGGESTED READINGS:

- Faridi, H. (2004). *The Science of Cookie and Crackers Production*. Delhi: CBS Publishers.
- Griffin, S. (1997). *Principles of Food Packaging*. Connecticut: The AVI Publishing Company.
- Khetrpal, N., Grewal, R.B., and Jood, S. (2005). *Bakery Science and Cereal Technology*. Delhi: Daya Publishing House.
- Khanna, K., Gupta, S., Seth, R., Mahana, R., and Rekhi, T. (2004). *The Art and Science of Cooking*. Delhi: Phoenix Publishing House Private Limited.
- Potter, N., and Hotchkiss, J.H. (2006). *Food Science*. Delhi: CBS Publishers.
- Raina, U., Kashyap, S., Narula, V., Thomas, S., Suvira, Vir, S., and Chopra, S. (2005). *Basic Food Preparation – A Complete Manual*. Delhi: Orient Longman.
- Sharma, S., Aggarwal, M. & Sharma, S. (2018). *Food Frontiers*. Delhi: New Delhi Publishers.
- Radhakrishnan, S. (2016). *A Guide To Baking Process*: Write And Print Publications.
- Cauvain, S.P. (2003). *Bread Making Improving Quality*: Elsevier.
- Baking courses: <https://www.udemy.com/topic/baking/>.(accessed on 17.3.2023)
- Baking guide: <http://www.reviewlab.com/baking-guide/>.(accessed on 17.3.2023)

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