GENERIC ELECTIVE COURSE
GE FT02- Technology of Food Processing and Preservation

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

CourseTitle & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of thecourse (if any)
		Lecture	Tutorial	Practical		
Technology of Food Processing and Preservation	4	3	0	1	Grade XII Pass	

Learning Objectives

The objective of this subject is to impart the basic concept of food colloids, freezing, dehydration processes and equipment used during the processing, principles of thermal processing, Minimal Processing and hurdle technology and to understand the concept of water disposal and sanitation

Learning Outcomes

Students will be able to:

1. Understand the concept of food processing operation systems such as food colloids, Freezing, Dehydration processes and equipment used in food industry.
2. Comprehend the Principles of minimal Processing, thermal processing such as aseptic Processing, UHT Irradiation and microwave heating, hurdle technology and their applications in food industry.
3. Understand the concepts of water disposal and sanitation

SYLLABUS

THEORY
(Credits 3; Hours 45)

UNIT I: Food Processing Operations **20 Hours**

- **Refrigeration and Freezing:** Requirements of refrigerated storage - controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes during freezing

Freezing methods -direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing.

- **Dehydration:** Normal drying curve , effect of food properties on dehydration, change in food during drying, drying methods and equipments: air convection dryer, tray dryer, tunnel dryer ,continuous belt dryer , fluidized bed dryer, dryer, drum dryer, vacuum dryer , freeze drying, foam mat drying.
- **Thermal Processing of Foods:** Classification of thermal processes, Principles of thermal processing, commercial canning operations, Aseptic Processing, UHT Irradiation and microwave heating. Principles, Dosage, Applications of Irradiation, Mechanism of microwave heating and applications.

UNIT II: Technology of Colloids in Food **5 Hours**

- Surface chemistry (colloids, emulsions, foam, sols, gels, pectin gels)

Unit III: Water Disposal and Sanitation **5 Hours**

- Waste water , hardness of water, break point chlorination, physical and chemical nature of impurities, BOD, COD, waste water treatment, milk plant sanitation, CIP system, sanitizers used in food industry

Unit IV: Minimal processing and hurdle technology **5 Hours**

PRACTICAL
(Credit 1; Hours 30)

- Study of canning equipment (Forming, Flanging, Seaming, Exhausting and Retort)
- Canning of foods
- Preservation of food by the process of freezing
- Drying of food using Tray dryer/other dryers
- Study of thawing characteristics of frozen foods
- Preparation of brix solution and checking by hand refractometer
- Analysis of water
- Minimal Processing of food
- Application of colloidal chemistry in food preparation

Essential Readings (Thoery)

1. Deman, J.M. (2007).Principles of Food Chemistry, 3rd Ed. Springer.
2. Potter, N. and Hotchkiss H. (2007).Food Science. New Delhi: CBS Publication.
3. Ramaswamy, H. and Marcotte, M. (2009).Food Processing Principles and Applications. CRC Press.
4. Fellows' Food Processing Technology Principles and Practice 5th Edition (2022) Elsevier Publishing

Essential Readings (Practical):

1. A., Rashida & Joy, P.P.. (2014). A Food Technology Lab Manual.
2. FSSAI, M. (2015). Manual of methods of analysis of foods. *Method*, *16*, 56-61.

3. Coles, R., McDowell, D. and Kirwan, M.J. (2003).Food Packaging Technology. CRC Press, 2003.
4. Meyer LH.(1987). Food Chemistry, CBS Publication, New Delhi