

DISCIPLINE SPECIFIC ELECTIVE
DSE HH 4B1 : Food Science and Processing

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 Science and Processing	4	2	0	2	XII Pass	Appeared in Food Science and Nutrition

Learning Objectives

- To enable students to understand the basic chemistry, science of food and techniques involved in food processing.
- To impart knowledge of sensory evaluation of food.
- To understand the role of microorganisms in food processing, preservation and spoilage.

Learning Outcomes

- Food science and its interplay in processing of food.
- Understanding of role of microorganisms in preservation and spoilage of food.
- Application of technology in food processing.
- Basics concepts of sensory evaluation in foods and its applications in different food metrics.

SYLLABUS OF HH 4B1

THEORY
(Credits 2; Hours 30)

UNIT I: Understanding to Food Science and Food Chemistry 12 Hours

The unit will provide an understanding of the basic terms used in food science, its interdisciplinary approach and applications. It will also provide knowledge about food sources, chemistry and functional properties of important components of the food. Concept of how colloidal systems are formed and their applications in the food industry will also be discussed.

- **Food Science:** Definition, importance and scope of food science.
- **Food Chemistry-** Sources, chemistry and functional properties of Carbohydrates, Lipids and Proteins.
- **Colloidal Chemistry-** Definition, classification, properties and applications of sols, gels, foams and emulsions.

UNIT II: Food microbiology 6 Hours

The unit will introduce microorganisms involved in food spoilage and preservation.

- **Introduction to microorganisms in food** - Characteristics of predominant micro-organisms in food (yeast, mold and bacteria), bacterial growth curve, intrinsic and extrinsic factors for growth of microorganisms.

- **Role of microorganisms in spoilage and preservation of food-** Important food spoilage micro-organisms (psychotrophic, thermophilic, osmophilic microbes), spoilage in specific food groups (raw meat, fruits & vegetables, milk and milk products), role of microorganisms in food fermentation.

UNIT III: Food processing Techniques

8 Hours

The unit provides an understanding of different food processing techniques, and their applications in food preservation.

- **Food processing techniques-**Non-thermal techniques - refrigeration, freezing, additives, filtration, osmosis, irradiation.
Thermal processing techniques – Blanching, dehydration, canning, pasteurization, concentration.

UNIT IV: Sensory Science

4 Hours

The unit will help in understanding of the physiological basis of the sensory evaluation of food and subjective and objective methods of sensory evaluation.

- Physiological basis of sensory evaluation
- Subjective and objective methods of sensory evaluation

PRACTICAL

(Credits 2; Hours 60)

1. Food analysis: Moisture, pH and acidity using standard methods. Total soluble solids (by refractometer).
2. Analysis of hygiene of college canteen and understanding the applications of GHP, HACCP, ISO 22000.
3. Identification of bacteria, yeast and mold from prepared slides.
4. Preparation of foam, gel and emulsion to understand their properties.
5. Preservation of food using non-thermal techniques (Freezing, use of additives).
6. Preservation of food using thermal techniques (Dehydration/Drying/Concentration).
7. Sensory evaluation of given food samples using different sensory evaluation methods.

Essential Readings:

- Frazier WC and Westhoff DC (2014). Food Microbiology, Fifth Edition. TMH Publication, New Delhi.
- Manay NS and Shadaksharaswamy M (2008). Food-Facts and Principles, Third Edition. New Age International (P) Ltd. Publishers, New Delhi.
- Mathur P. (2018). Food Safety and Quality Control. Orient BlackSwan Pvt. Ltd., Hyderabad.
- Suri S and Malhotra A (2014). Food Science, Nutrition and Safety. Delhi: Pearson India Ltd., New Delhi.
- Potter NN and Hotchkiss H J (1996). Food Science, Fifth Edition. CBS Publication, New Delhi.
- Srilakshmi B (2014). Food Science, 6th Edition. New Age International Ltd., Delhi.

Suggested Readings:

- Mohini Sethi, Eram Rao (2011). Food science- Experiments and applications, Second Edition. CBS publishers & Distributors Pvt Ltd., New Delhi
- Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation: A Complete Manual, Fourth Edition. Orient Black Swan Ltd., New Delhi.
- Sivashankar. B (2002). Food Processing and Preservation. PHI learning Pvt. Ltd., New Delhi

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