

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 3B1 : Food Science**

**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	4	2	0	2	XII Pass	Pass in DSC HP 205 Foundation of Food Science and Nutrition

**Learning Objectives**

1. To enable students to understand how food is produced, processed, prepared and preserved.
2. To impart systematic knowledge of sensory & objective evaluation, food laws and their applications in processing of food to meet quality standards.
3. To acquire knowledge about the role of microorganisms in food processing, preservation and spoilage.

**Learning outcomes**

The students would be able to:

1. Students learn the principles and working of various techniques in order to preserve food, to provide safe food for consumption and produce nutritious food.
2. Gain knowledge of methods of food quality evaluation and applications of food laws essential for maintaining food quality and safety.

**SYLLABUS OF 3B1**

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

**UNIT I: Understanding of Food Science and chemistry**

**12 Hours**

The unit will provide an understanding of the basic terms used in food science, its interdisciplinary approach and applications. The unit will also provide knowledge of the 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 be discussed.

Subtopics:

- Introduction to food science: Definition, importance, applications 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: Basic Food Microbiology****8 Hours**

The unit will introduce types of food microorganisms, and their role in spoilage

*Subtopics:*

- Introduction to microbes in food - Characteristics of predominant micro-organisms in food (yeast, mold and bacteria), bacterial growth curve, factors influencing growth of microorganisms.
- Role of microorganisms in spoilage - Important food spoilage micro-organisms (psychotrophic, thermophilic, osmophilic microbes), spoilage in specific food groups (raw meat, fruits & vegetables), role of microorganisms in food fermentation.

**UNIT III: Food Preservation Techniques****5 Hours**

The unit provides an understanding of different food preservation techniques, and their applications in extending shelf life of different food product.

- Low temperature: Freezing, refrigeration
- High temperature: Drying and dehydration, canning, pasteurization
- Irradiation and use of additives

**UNIT IV: Sensory Science****5 Hours**

The unit will help in understanding the sensory quality attributes and sensory evaluation of food.

*Subtopics:*

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

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

- Food analysis: Moisture, pH, acidity, Total soluble solids using standard methods of FSSAI.
- Assessment of surface sanitation by swab/rinse method.
- Implementation of GHP, HACCP, ISO 22000 using suitable example.
- Slide preparation and identification of micro-organisms.
- Application of colloidal chemistry to food preparation.
- Preservation of food using different methods (Blanching, Dehydration, Freezing).
- Sol /gel formation and factors affecting gel formation
- Recognition and threshold for basic tastes.
- Evaluation of food labels in accordance with FSSAI rules and regulations on Food labeling and Packaging.

**Essential readings**

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

**Suggested readings:**

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

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