

DISCIPLINE SPECIFIC ELECTIVE COURSE**DSE FT 07: FOOD ADDITIVES****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit Distribution of the Course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical		
Food Additives DSE FT 07	4	2	0	2	Studied XII	PCM/PCB

Learning Objectives

- To understand the significance of food additives in food processing and preservation.
- To appreciate the technological functions of additives in foods.
- To comprehend the chemistry and toxicological aspects of food additives.

Learning Outcomes

- Apply the knowledge of food additives in food processing and preservation.
- Appreciate the chemical, technological functions, and toxicological evaluation of food additives in food preservation.

SYLLABUS OF DSE FT 07**THEORY**
(Credit 2; Hours 30)**UNIT I: Introduction to Food Additives****8 Hours**

Unit description: The unit will provide information on the classification, significance, toxicological evaluation and regulatory aspects of food additives used in food processing and preservation.

- Definition, classification, and significance of food additives in food processing and preservation.
- Food Category System of FSSAI- Vertical and Horizontal standards.

- Toxicological evaluation of food additives -Risk assessment studies- Safety and quality evaluation of additives, Acute and chronic studies, NOAEL, ADI, LD₅₀
- Regulatory aspects of food additives.

UNIT II: Preservatives

7 Hours

Unit description: The unit will provide insight to different kinds of preservatives, their classification and mechanism of action, technological and toxicological aspects used in food industries.

- Importance, classification: Class I and Class II preservatives.
- Antimicrobials: mechanism of action, chemical, technological, and toxicological aspects- Sulfites, nitrates, benzoates, and their salts.

Unit III: Colours and Sweeteners

8 Hours

Unit description: This unit will focus on importance, classification, safety concerns and recent developments in colours and sweetening agents that are used in food industries.

- **Colours-** Importance and classification
- Application and their safety concerns.
- Recent developments in the food industry.
- **Sweeteners-** Importance and classification
- Consideration for choosing sweetening agents.
- Recent developments of sweeteners in food industry

Unit IV: Emulsifiers, Stabilizers, Thickeners

7 Hours

Unit description: There are various emulsifiers, stabilizers and thickeners that are used in food industries. This unit will introduce functions, mechanism of action and recent developments in these in the food industry

- Introduction, functions, and mechanism of action
- Permitted emulsifiers, stabilizers, thickeners used in foods.
- Recent developments in the food industry.

PRACTICAL (Credit-2; Hours 60)

1. Qualitative estimation of Sulphur dioxide in beverages.
2. Quantitative estimation of Sulphur dioxide in beverages.
3. Qualitative estimation of benzoic acid in ketchup and sauces.
4. Extraction of food pigments and effect of heat and pH on stability.
5. Paper chromatographic estimation of colours.
6. Analysis of moisture content in different edible salts.
7. Analysis of matter insoluble water (MIW) and total chlorides in edible salt.

Essential Readings

- Sen, M. (2021). Food Chemistry: The Role of Additives, Preservatives and Adulteration. United States: Wiley.

- Brannen, D., & Salminen, T. (2002). *Food Additives*. 2nd edition. New York: Marcel Dekker, Inc.
- Fennema, O. R. (1996). *Food chemistry* (Vol. 76). CRC Press.
- Baines, D., & Seal, R. (Eds.). (2012). *Natural food additives, ingredients, and flavourings*. Elsevier.
- Msagati, T. A. M. (2013). Chemistry of food additives and preservatives: emulsifiers.

Suggested Readings

- Codex Alimentarius Commission (2001). Class names and the international numbering system for food additives. Codex Alimentarius: Vol. 1A—General Requirements.
- WHO (1987). Principles for the safety assessment of food additives and contaminants in food. Environmental Health Criteria 70. World Health Organization, Geneva.
- FDA. (1993). Toxicological Principles for the Safety Assessment of Direct Food Additives and Colour Additives used in Food (Redbook II). National Technical Information Services, Springfield, Virginia.
- Emerton, Victoria, "Food Colours". Blackwell Publishing, 2008.
- Mahindru, S. N. (2000) Food Additives- Characteristics Detection and Estimation, TATA McGraw Hill.
- DeMan. (2007). *Principles of Food Chemistry*. Springer, 3rd edition.
- Davidson, P. M., & Branen, A. L. (1993). Antimicrobials in Foods. Marcel Dekker, New York.

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