

# Department of Chemistry

## Add On Course

*An endeavour towards future footstep*

**Course Title: Understanding the Food Additives, Preservatives and their Impacts**

**Kishore Bharati Bhagini Nivedita College (Co-Ed)**

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## Add On Course Plan Specification

### Subject Name: Chemistry

#### A. Basic Information:

Course title	<b>Understanding the Food Additives, Preservatives and their Impacts</b>
Name of Course Coordinator	<b>Mr. Mahananda Roy</b>
Credit hours	<b>30</b>
Programs in which the course is offered	<b>B.Sc. Honours and General</b>
Level/Year at which this course is offered	<b>4Th Semester</b>

#### B. Course Objectives:

The course objectives for the "Food Additives, Preservatives and its impacts" course are designed to ensure that students achieve a comprehensive understanding of the topic and develop practical skills relevant to the field of food science. Here are the specific course objectives:

- 1. Understand the role and significance of food additives:** Students will gain knowledge about the definition, purpose and historical context of food additives, including their importance in food preservation, flavour enhancement, texture modification, and shelf-life extension.
- 2. Classify and categorize food additives:** Students will learn to classify food additives based on their functional categories, such as preservatives, antioxidants, emulsifiers, flavour enhancers, sweeteners, thickeners, and stabilizers.
- 3. Examine the safety and regulatory aspects of food additives:** Students will explore the safety considerations associated with food additives, including risk assessment, toxicity, acceptable daily intake (ADI) and regulatory requirements set by governing bodies such as the FDA and EFSA.
- 4. Analyse the mechanisms of action of preservatives and antioxidants:** Students will understand the mechanisms by which preservatives and antioxidants function to prevent microbial growth, delay oxidation and maintain the quality and safety of food products.
- 5. Evaluate the use of preservatives, antioxidants, flavour enhancers and sweeteners in food products:** Students will examine common examples of food additives used in the food industry, including their applications, efficacy and potential health implications.
- 6. Explore emerging trends and future directions in food additive research:** Students will investigate current trends, challenges and opportunities in the field of food additives, including the development of natural alternatives, clean label formulations and innovative technologies.
- 7. Develop practical skills in food formulation and product development:** Students will engage in hands-on activities, laboratory demonstrations and formulation exercises to apply theoretical knowledge and develop practical skills in formulating food products with specific additives.
- 8. Enhance critical thinking and problem-solving abilities:** Students will critically analyse case studies, evaluate scientific literature and participate in group discussions to assess the ethical, environmental and societal implications of using food additives and preservatives.

**9. Communicate effectively about food additives and preservatives:** Students will demonstrate effective communication skills through oral presentations, written assignments, and group projects, conveying complex scientific concepts in a clear and accessible manner.

**10. Promote awareness of food safety and consumer education:** Students will recognize the importance of transparent labelling, consumer education and responsible use of food additives in promoting food safety, public health and consumer trust in the food supply chain.

By achieving these course objectives, students will develop a comprehensive understanding of food additives and preservatives, along with the necessary skills to critically evaluate their use and contribute to advancements in the field of food science and technology.

### C. Course Description:

Module	Unit	Credit	Hour
Module-I Introduction to Food Additives	Introduction to food additives: Definition, purpose, and historical perspective	0.5	0.5
	Classification of food additives: Functional categories	0.5	0.5
	Regulatory aspects: Laws, regulations, and governing bodies (FDA, EFSA, etc.)	1	1
	Safety considerations: Risk assessment, toxicity, and acceptable daily intake	1	1
	Labelling requirements: Understanding food labels and ingredient lists	1	1
	Tutorial: Examples of commonly used food additives and their functions	2	2
Module - II Preservatives and Antioxidants	Introduction to food preservation: Historical methods and modern techniques	0.5	0.5
	Types of preservatives: Natural vs. synthetic, antimicrobial vs. antioxidant	1	1
	Mechanisms of action and effectiveness	0.5	0.5
	Common preservatives: Examples, uses, and safety considerations	0.5	0.5
	Antioxidants: Importance in food preservation, types, and applications	1	1
	Tutorial: Composition of milk	2	2
Module - III Flavour Enhancers and Sweeteners	Flavour enhancers: MSG, nucleotides, and other additives	1	1
	Sweeteners: Natural vs. artificial, nutritive vs. non-nutritive	1	1
	Safety concerns and controversies	0.5	0.5
	Functional properties of sweeteners: Sweetness intensity, stability, and solubility	1	1
	Regulatory status and labelling requirements for flavour enhancers and sweeteners	1	1
	Practical: Analysis of antioxidants using spectrophotometric methods (e.g., DPPH assay)	2	2
Module -IV Emulsifiers, Thickeners, and Stabilizers	Emulsifiers: Role in food production, types, and applications	0.5	0.5
	Thickeners and stabilizers: Functionality and examples	0.5	0.5
	Safety considerations and health effects	1	1
	Interaction with food matrices: Effects on texture, appearance, and mouthfeel	1	1
	Formulation challenges and solutions in food product development	1	1
	Practical: Determination of preservatives using chromatographic techniques (e.g., HPLC)	2	2
Module - V Emerging Trends and Future Directions	Current trends in food additives and preservatives: Clean label movement, natural alternatives	1	1
	Emerging technologies: Nanotechnology, encapsulation, and controlled release systems	1	1
	Impacts on human life	0.5	0.5
	Future challenges and opportunities in food additive research and development	0.5	0.5
	Ethical and sustainability considerations in food production and consumption	1	1
	Practical: Determination of methyl alcohol in alcoholic beverages	2	2
<b>TOTAL</b>		<b>30</b>	<b>30</b>

**Assessment:**

Weekly quizzes or assignments (20%)

Mid-term examination (30%)

Culminating project and presentation (30%)

Class participation and engagement (20%)

**D. Course Components (total contact hours):**

<b>Lecture: 20</b>	<b>Tutorial: 4</b>	<b>Practical: 6 Hours</b>
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Additional private study/learning hours expected for students: **15 hours****Scheduling of Assessment Tasks for Students:** **As and when required****E. Faculty and Staff Requirements for the Course:**Numbers of Faculty Required: **1 (External Expert) + 2 (Internal)**Number of Staff Required: **1****F. Learning Resources:**Required Text(s): **Available in Library**Electronic Media: **Available****G. Facilities Required:**Classroom with ICT facility: **Available****H. Course Evaluation and Improvement Processes:****Strategies for Obtaining Student Feedback on Effectiveness of Teaching****Action taken plan based on feedback**

Principal

Course Co-ordinators