

As Per NEP 2020

University of Mumbai



Syllabus for Basket of OE	
Board of Studies in Biotechnology	
UG First Year Programme	
Semester – II	
Title of Paper	Credits 2/ 4
I) OE: Food preservation and Food packaging	2
II)	
From the Academic Year (2023-24 Progressively)	

OE

Name of the Course: Food preservation and Food packaging

Sr. No.	Heading	Particulars
1	Description the course : Including but Not limited to :	The course on Food Preservation and Packaging focuses on essential concepts and techniques in the food industry, emphasizing the historical context and importance of food preservation. It covers various preservation methods, including physical and chemical techniques and emerging technologies, and packaging materials, methods, and selection parameters for food safety and quality. The course enhances learners' job prospects and industry demand for skilled professionals proficient in food preservation and packaging.
2	Vertical :	Open Elective
3	Type :	Theory
4	Credit:	2 credits
5	Hours Allotted :	30 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives(CO): CO 1. Understand the principles and methods of food preservation including physical, chemical and biological processes. CO 2. Learn about different preservation techniques CO 3. Understand the importance of food preservation in extending shelf life, reducing food waste and ensuring food security. CO 4. Learn about emerging technologies in food preservation CO 5. Understand role of packaging in preserving the quality and safety of food products And different types of food packaging materials and their uses CO 5. Understand the factors influencing the selection of appropriate packaging materials. And Learn about innovative packaging technologies	
8	Course Outcomes: Learner will be able to OC 1. Understand the principles behind various food preservation techniques OC 2. Apply appropriate preservation methods to different types of foods based on their characteristics and shelf life requirements OC 3. Identify the factors that contribute to food spoilage and implement strategies to prevent or minimize it. OC 4. Understand the importance of food packaging in maintaining food quality, safety and shelf life. OC 5. Identify different types of packaging materials, their properties, advantages and limitations. OC 6. Apply principles of packaging design to create functional, attractive and consumer friendly packaging solutions.	

9	Modules:- Module 1: Food Preservation Techniques 1. Food contamination & spoilage- Concept , definition and difference. Diseases caused and economic losses. (1 lecture) 2. Introduction to Food Preservation - Concept and importance, History of food preservation (2 lectures) 3. Physical Methods - Blanching, pasteurization, canning, chilling freezing, irradiation, dehydration (4 lectures) 4. Chemical Methods- Salt, sugar, sodium benzoate, metabisulfite, citrate, acetate (4 lectures) Emerging Preservation Technologies- Natural antimicrobials, hydrostatic pressure, electric pulse, light pulse, high magnetic pulse (4 lectures) Module 2: Packaging of Food 1. Introduction to food packaging- definition, need and functions of food packaging and their Characteristics, packaging materials for different food products in market. (3 lectures) 2. Types of packages and packaging materials - classification based on contact with food, flexibility, manufacture, clarity, occurrence, fat content of food. glass, paper, metal, plastics, PE foam, shrink, pre-stretched film, skin packaging film bubble pack, Biodegradable packaging, etc.(4 lectures) 3. Packaging Methods- Aseptic packaging, retortable pouches, MAP, CAP, Shrink, vacuum, Nitrogen flush, Edible packaging.smart and active packaging (3 lectures) 4. Selection parameters for Packaging- Shelf life testing, convenience and hazards of packaging materials, moisture sorption properties of foods and selection of packaging material, Food and food packaging interactions. (4 lectures) 5. Finishing and transporting (1lecture)
10	Text Books: 1. Food Processing and Preservation, B.Sivashankar 2002,PHL 2. Food Packaging Technology Handbook 2nd Edition, 2012, NPCS 3. Food processing and preservation, 2nd Edition, G. Subbulakshmi, Shobha Udupi and Padmini Ghugre,2021, New age International Publishers 4. Food Packaging: Principles and practice, 3rd Edition, 2016, Gordon Robertson, CRC Press

11	Reference Books: 1. Food Processing and Preservation, 1st Edition,2021, Deepak Mudgil&Shweta Mudgil , Scientific Publishers 2. Food Preservation and safety- principles and Practices, Van GardeS..J. And Woodburn M. 2001, Surabhi Publications 3. Packaging and storage of fruits and vegetables: Emerging Trends 1st Edition, edited by Tanweer Alam, 2021; CRCPress 4. Fundamentals of Food Processing,Packaging,Labelling and Marketing, 2014, Vikas Chaudhary , Lakshi Publishers
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12	Internal Continuous Assessment: 40%	External, Semester End Examination: 60% Individual Passing in Internal and External Examination
13	Continuous Evaluation through: Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc. (at least 3)	
14	Format of Question Paper: Semester End Examination theory - 50 Marks	

**Sign of the BOS
Chairman
Dr. Varsha Kelkar-Mane
Ad-hoc BoS
(Biotechnology)**

**Sign of the
Offg. Associate Dean
Dr. Madhav R. Rajwade
Faculty of Science &
Technology**

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