SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

DEPARTMENT OF BIOCHEMISTRY

CERTIFICATE COURSE IN APPLIED BIOCHEMISTRY – SYLLABUS

(Under CBCS based on OBE) (For those admitted during 2024 – 2025 and after)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24CBCC11	FOOD FORTIFICATION TECHNOLOGY	CERTIFICATE COURSE	20 HRS.	-	-

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	-	-	100	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	✓	✓	✓

COURSE DESCRIPTION:

This course has been designed to enable the students to get an idea what is Food fortification, as in current scenario it is an emerging field in nutrition. The course also justifies the needs and objectives of food fortification.

COURSE OBJECTIVES:

- To enumerate the term food fortification, its need, objective and criteria for selection of vehicle
- To explain the economic aspect and technologies used in food fortification.
- To determine nutrient interaction and bioavailability of nutrients from fortified foods.
- To develop suitable fortified food commodities to eradicate micronutrient malnutrition.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the need for food fortification	Upto K3
CO 2	inculcate knowledge on types of food fortification	Upto K3
CO 3	acquire skills needed for the process of fortification	Upto K3
CO 4	comprehend the technology of fortification of common foods	Upto K3
CO 5	understand the challenges in food fortification and its applications	Upto K3

K1–KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY

Passed in the BoS Meeting held on 09/03/2024 **Signature of the Chairman**

FOOD FORTIFICATION TECHNOLOGY

UNIT – I:

Food Fortification- Needs, objectives, principles and rationale, selection and basis of fortificants

UNIT – II:

Technology of fortifying cereal products- Characteristics of nutrients used in cereal fortification; Types and levels of micronutrients to be added; Fortification methods; Fortification premixes, Fortification of bread, pasta, noodles, biscuits, and breakfast cereals.

UNIT – III:

Technology of fortifying beverages, candies, snack products

a) Technology of fortifying beverages - Importance of beverage fortification, Health benefits of fortification, Selection of nutrients for fortification, Levels to be added.
b) Technology of fortifying candies - Product formulation, Factors to be considered in selecting fortificants.
c) Snack products - Rationale for micronutrient fortification of snack products, Merits and demerits of fortification.

UNIT – IV:

Other special fortified products - salt, sugars, oils, Nutri-bars, Granola bars.

a) Salt -Technology of fortifying salt with iron and iodine, Iodine stability and quality of double fortified salt.
b) Sugars - Fortification with iron and vitamin A, Premix formulation, Fortification level.
c) Oils- Fortification with vitamin A, Rationale of vitamin A fortification.
d) Nutri bars - Selection of nutrient, Advantages and disadvantages of fortification
e) Granola bars- Incorporation of fortificants, Technology of fortification.

UNIT – V:

Health Foods - Selection of nutrients, Technology of incorporation, Bioavailability, Packaging.

TEXT BOOKS

1. Subbulakshmi and Udipi.S., 2001., ***Food processing and Preservation Technology***., New Age Publications., New Delhi, India.
2. Khader.V, 2001., ***A Textbook of Food Processing Technology***, ICAR, New Delhi, India

REFERENCE BOOK:

Sivashankar. B., 2002, ***Food Processing and Preservation***, PHI, New Delhi, India.

DIGITAL TOOLS:

1. https://www.studocu.com/in/document/mahatma-gandhi-university/clinical-nutrition-and-dietetics-model-iii/fortification-notes/25049418
2. https://www.webmd.com/diet/what-to-know-about-fortified-foods
3. https://egyankosh.ac.in/bitstream/123456789/12280/1/Unit-11.pdf
4. https://www.researchgate.net/publication/51874158_Food_fortification

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO4
CO1	3	2	3	3	2
CO2	2	3	1	3	3
CO3	3	3	2	2	1
CO4	2	1	3	3	2
CO5	1	3	2	3	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. A. R. SARANYADEVI

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(Under CBCS based on OBE) (For those admitted during 2024 – 2025 and after)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24CBCC12	HOSPITAL WASTE MANAGEMENT	CERTIFICATE COURSE	20 HRS.	-	-

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	-	-	100	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	✓	✓	✓

COURSE DESCRIPTION:

The course focuses on practical measures to manage hospital waste production, through various technologies. The course focuses on practical measures to manage hospital waste production, through various technologies.

COURSE OBJECTIVES:

- To know the basic knowledge of healthcare waste.
- To create the awareness of hazard of biomedical waste.
- To study about the hospital management and controlling of the wastages.
- To learn about the types of treatment technologies for wastes.
- To study about the professional ethics of biomedical waste handling.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	analyse various hazards, accidents and its control	Upto K3
CO 2	design waste disposal procedures for different biowastes	Upto K3
CO 3	categorise different biowastes based on its properties	Upto K3
CO 4	design different safety facility in hospitals	Upto K3
CO 5	propose various regulations and safety norms	Upto K3

K1–KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY

HOSPITAL WASTE MANAGEMENT

UNIT – I: INTRODUCTION

Definition of general and hazardous healthcare waste, Infectious waste, geno-toxic waste, waste sharps, categorization andcomposition of Biomedical waste, major and minor sources of biomedical waste, Segregation of waste, Color coding, waste handling and disposal

UNIT – II: HAZARD OF BIOMEDICAL WASTE

Need for disposal of biomedical waste, Specifically Communicable diseases, Diseases epidemiology and mode oftransmission of disease, Environmental pollution by biomedical waste-causes, consequences, mitigation and remedies.

UNIT – III: CONTROL OF HOSPITAL ACQUIRED INFECTION

Types of infection – Common Nosocomial infection and their Causative Agents– Prevention of hospital acquired infection–Role of central sterile supply department–Infection control committee –Monitoring and controller of cross infection-Staff health.

UNIT – IV: TREATMENT TECHNOLOGIES FOR WASTES

Mechanical Treatment & Chemical Disinfections, Conventional Treatment Technologies: Wet thermal technology, Incineration, Microwave Technology, Autoclave system, Hydroclave system, Electro Thermal Reactivation (ETP), Treatment Process Electron beam Technology, Plasma Pyrolysis / Gasification systems

UNIT – V: LAWS OF BIOMEDICAL WASTE HANDLING

Biomedical wastes ,Disposal of biomedical waste products and deep burial, Segregation, Packaging, Transportation, Storage Legislation, policies and law regarding environment on Healthcare waste Management, Biomedical wastemanagement and handling rules 1998 and its amendment. CPCB guidelines. World Health Organization guidelines on Management of wastes from hospital wastes.

TEXT BOOKS:

1. Anantpreet, Singh, SukhjitKaur ., 2012., Biomedical Waste Disposal., Jaypee Publishers (P)Ltd, India.
2. Sushma Sahai (2009) Bio-Medical Waste Management APH Publishing Corporation, India

REFERENCES BOOK:

Sanskriti Sharma (2002) Hospital Waste Management and Its Monitoring , JaypeePublishers (P)Ltd, India

DIGITAL TOOLS:

1. https://www.slideshare.net/zulfiquer732/hospital-waste-management-93579083
2. http://www.ihatepsm.com/blog/hospital-waste-management-bio-%E2%80%93-medical-waste-management
3. https://www.biomedicalwastesolutions.com/medical-waste-disposal/
4. http://www.wastemanagement.in/what-is-hospital-waste-management.html

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO4
CO1	3	1	3	3	2
CO2	3	3	2	3	3
CO3	3	3	2	2	1
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CO5	2	3	1	3	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNERS: Prof. A. R. SARANYADEVI

Passed in the BoS Meeting held on 09/03/2024 Signature of the Chairman