CORE VI

FOOD AND DAIRY MICROBIOLOGY

Semester	Subject code	Category	Lecture		Theory		Practical		Credit
			Total hrs	Hrs/ week	Total hrs	Hrs / week	Total hrs	Hrs/ week	
V		Core	60	4	60	4	0	0	4

COURSE OBJECTIVES

To enable the students to understand the aspects of microbial processes applicable in industries and scale up processes

COURSE OUTCOMES

On the successful completion of the course, students will be able to develop strong and potential skills in the various aspects of microbial processes in industries.

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	To identify microorganisms of relevance to food microbiology.	**K3**
CO2	To enable the students obtain the advanced knowledge on various food preservation methods	**K2**
CO3	To make the students to understand the sources of contamination and spoilage of various food and food products.	**K2**
CO4	To impart knowledge of various food borne	**K2**

	diseases and its prevention.	
CO5	To understand the Microorganisms associated with milk and milk products and about the fermented foods.	**K3**

MAPPING WITH PROGRAMME OUTCOMES:

COS	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
CO1	S	S	S	S	S	S
CO2	M	S	M	S	S	S
CO3	S	S	S	S	S	S
CO4	S	M	M	S	S	S
CO5	S	M	M	S	S	S

S- Strong; M- Medium; L- Low

Unit I: Food Microbiology 12 hrs

Food as a substrate for microorganisms. Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, Microbial Foods: Mushrooms – *Agaricus bisporus*, *Volvariella* sp. – Cultivation – Nutritional value.

Unit II: Preservation of food 14 hrs

Principles, physical methods of food preservation: temperature (low, high, canning, drying), irradiation, hydrostatic pressure, high voltage pulse, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, SO_2, nitrite and nitrates, ethylene oxide, antibiotics and bacteriocins.

Unit III: Contamination and spoilage 10 hrs

Sources of food contamination. Spoilage of vegetables, fruits, meat, fish, eggs, milk, bread and canned foods.

Unit IV: Food borne diseases and intoxication 12 hrs

Food borne disease – Food borne infections and intoxication – laboratory testing – preventing measures - Food sanitation – - Food sanitation and control – HACCP. Employee's health standards.

Unit V: Dairy Microbiology 12 hrs

Microbiology of milk – Fermented dairy products – cheese – yoghurt. Nutritive value, method of production. Milk borne diseases. Bread – vinegar – Fermented Vegetables – Sauerkraut.

DISTRIBUTION OF MARKS: Theory **-** 100% and Problems – Nil

TEACHING METHODOLOGY:

- **Lectures**
- **Power point presentation**
- **Charts**
- **Models**
- **Group discussion**
- **Group assignments**

TEXT BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Frazier WC and Westhoff DC	Food Microbiology.	Tata McGraw Hill Publishing Company LTD . New Delhi.	2014
2	Adams M.R and Moss	Food Microbiology.	The Royal Society of Cambridge.	2015

3	Cassida, J.E	Industrial Microbiology	New Age International	2007
4	Patel A H	Industrial Microbiology.	Laxmi Publications, New Delhi; Second edition	2016

REFERENCE BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Robinson RK	Dairy Microbiology,	John Wiley and Sons, Inc., United Kingdom.	2002
2	Banwart G.J.	Basic Food Microbiology.	New Delhi : CBS Publishers & Distributors Pvt. Ltd.	2004
3	Stanbury. P.F, A. Whittakker & S.J. Hall	Principals of fermentation technology.	Pergmon Press.	2005
4	Peppler, H. J. and Pearlman, D.	Microbial Technology	Academic press.	2014
5	Demain, A. L. and Soloman INA	Manual of Industrial Microbiology and Biotechnology	American society for Microbiology, Washington DC.	1986

WEB REFERENCES

http://www.fsis.usda.gov/

http://www.microbes.info/

http://www.epa.gov/nerlcwww/

SYLLABUS DESIGNER

1. Dr. A.Vidhya, Assistant Professor and Head