Programme: M.Sc. (Microbiology)

Course Code: MIO 118

Title of the Course: FOOD MICROBIOLOGY [T]

Number of Credits: 3

Effective from Academic Year: 2018-19

Prerequisites	It is assumed that students know the nutritional quality of food to microorganisms and presence and types of different microorganisms in the food.	
Objective:	This course deals with the beneficial and harmful association of microorganisms with the food and prospective application of the microorganisms in food industry. Teaches the methods of controlling the type and number of microorganisms in the food as per requirement. Teaches about the role of food regulatory bodies and measures of food safety and quality control.	
Content:		
1.	**Microbial Food Spoilage and Food Preservation**	**(12)**
A.	Predictive food microbiology - Types of foods and their spoilage.	
B.	Factors affecting the growth and survival of microorganisms in foods: Intrinsic, Extrinsic.	
C.	Preservation methods: Heat processing, low temperature storage, control of water activity, irradiation, high pressure processing, modified atmospheres, preservatives: chemicals, natural organic molecules (nisin).	
2.	**Microbiology in Food Processes**	**(12)**
2.1	**Fermented and processed foods**	
A.	Indian fermented foods.	
B.	Oriental fermented foods.	
C.	Fermentations: wine	
2.2	**Genetically engineered microorganisms in the Food Industry**	
A.	Concept and role of genetically engineered microbes in the food industry.	
3.	**Food Safety and Quality Assurance**	**(12)**
3.1	**Food borne diseases**	
	Bacterial, with emphasis on emerging pathogens such as *E. coli* EHEC O157:H7 and other strains; *L. monocytogenes*, *H. pylori*; Fungal, Algal, Viral, Prions and other non-bacterial forms.	
3.2	**Quality control and Validation**	
A.	Microbiological examination of foods – sampling, culturing/analysis.	
B.	Plant sanitation.	
C.	Hazard Analysis and Critical Control Point (HACCP) concept.	
D.	Food Safety Act and Trade Regulations.	
E.	Good Manufacturing Practice (GMP) and Quality Systems.	

Pedagogy:	Lectures/tutorials/assignments/self-study	
References/ Readings	Adams, M. R. and Moss, M. O., Food Microbiology, New Age International (P) Limited Publishers, New Delhi.	
	Frazier, W. C. and Westhoff, D. C., Food Microbiology, M. C. Graw-Hill Companies, Inc., New York.	
	Jay, M. J., Loessner, M. J. and Golden, D. A., Modern Food Microbiology, Springer Science + Business Media Inc., New York.	
	Da Silva, N., Taniwaki, M. H., Junqueira, V. C. A., Silveira, N. F. A., Nascimento, M. S. do. and Gomes, R. A. R., Microbiological Examination Methods of Food and Water: A Laboratory Manual, CRC Press, Taylor & Francis Group, U.K.	
	Ramesh, K. V., Food Microbiology, MJP Publishers, Chennai.	
	Harrigan, W. F., Laboratory Methods in food Microbiology, CRC Press, Taylor & Francis Group.	
	Doyle, M. P. and Buchanan, R. L., Food Microbiology: Fundamentals and Frontiers, ASM Press.	
Learning Outcomes	Apply the knowledge about the food preservation, food fermentation, food safety, quality control and validation.	