



# MANGALORE UNIVERSITY

## DEPARTMENT OF BIOSCIENCES

### MSc Food Science & Nutrition

#### FNS 405 FOOD MICROBIOLOGY

39 Hr (13× 3 units)

#### Course Outcome

- Identify microorganisms, its history and scope of food microbiology.
- Describe about different type of microbes present and their beneficial as well as deleterious effect on food.
- Understand food borne pathogens, food spoilage and toxins produced by them and its health effect.
- Identify the importance of microbes in food industry for baking, fermentation and various traditional foods.

**Unit I:** History and scope of food microbiology. Types of micro-organisms associated with food- mold, yeast, and bacteria, Microbial growth pattern, physical and chemical factors influencing destruction of microorganisms. Growth curve, bacterial group based on morphology- gram positive, gram negative, motile, non-motile, sporulating and non sporulating. Microorganisms in natural food products and their control.

**Unit II:** Food spoilage: Food spoilage - definition, biochemical changes caused by microorganisms, deterioration and spoilage of various types of food products – Physical, chemical and microbiological spoilages (Enzymatic or fermentative spoilage – rancidity, hydrolytic spoilage, putrefaction, souring, off flavour etc.; Texture deformations – slime, ropiness, curdling, discoloration etc.; Contamination of fruits vegetables, cereals, pulses, oilseeds, milk and meat during handling and processing. Microbial spoilage of foods and food items – milk, cereals, fruits and vegetables, meat, egg, fish, poultry. Toxin production – endotoxins and exotoxins). Food borne diseases and infections, mycotoxins, typhoid, diarrhea, botulism, salmonellosis, staphylococcal intoxication. Food borne pathogens, food poisoning, food infection and intoxication - *E. coli* O157:H7, *Campylobacter jejuni*, *Bacillus cereus*, *Shigella* sp., Norwalk like viruses, Hepatitis A. Algal toxins.

**Unit III:** Fermentation and food borne diseases: Importance of microorganisms in food industry and food preparations (milk industry, meat, fish, baking). Food fermentation - Traditional fermented foods of India and other Asian countries; Probiotics and prebiotics: effect on gut microflora. Fermented foods based on milk, meat and vegetables; Fermented and alcoholic beverages.

## REFERENCES

- Banwart G J., 1987, Basic Food Microbiology, CBS Publishers andDistributors
- Frazier WC, Westoff DC. 1998, Food Microbiology, 4<sup>th</sup>Edition, Tata Mc Graw Hill Publishing Co. Ltd
- Prescott L M, Harley J P, Klein D A., 2008. Microbiology 6<sup>th</sup>ed., WMC BrownPublishers
- Pelczar MJ, Chan ECS, Krieg N. 1993. Microbiology 5<sup>th</sup>ed., Tata McGraw Hill Publishing Co.LtdGarbutt John, 1997. Essentials of Food Microbiology, Arnold London

