MICROBIOLOGICAL AND CHEMICAL ANALYSIS OF FOOD AND WATER

Objective:

- To isolate bacteria by different techniques
- To isolate and enumerate bacteria from food samples
- To analyse water samples using microbiological techniques
- To analyse the chemical properties of food
- To analyse the chemical properties of water

Unit I - Media preparation and isolation techniques: Safety Measures in the Laboratory (GLP), Media Preparation and Sterilization, Isolation & Enumeration by Pour Plate, Streak Plate and Spread Plate Technique, Staining Methods: simple & Gram staining

Unit II - Microbiological Techniques for Food Analysis: Total Plate Count (TPC), Yeast & Mould Count, Identification & Determination of Coliform, *Escherichia coli*, Salmonella, *Staphylococcus aureus, Pseudomonas aeruginosa, Bacillus cereus*, Filth Test, Shigella, *Vibrio cholera*, Enterobacteriaceae.

Unit III - Microbiological Techniques for Water Analysis: Collection of Water samples, Most Probable Number (MPN), Faecal streptococci, Biochemical Oxygen Demand

Unit IV - Chemical Analysis of Food: Fat, Protein, Carbohydrate, Energy Value, Moisture, Ash, Acid Insoluble Ash, Sugar Content, Acidity, Crude Fibre and Salt. **Oils & Fats:** Acid Value, Iodine Value, Peroxide Value, Saponification Value, Rancidity.

Unit V - Chemical Analysis of water: Total Dissolved Solids, Salinity, Chloride, Conductivity, Dissolved oxygen, pH, Alkalinity and Hardness.

References:

Doyle, M. P. and Beuchat, L. R. (2007). Food Microbiology: Fundamentals and Frontiers (3rd Ed.). ASM Press

Nielsen, S. (2017) Food Analysis (5th Ed.). Springer International Publishing.

Relevant SLS and ISO standards.

Course Outcomes:

Upon successful completion of this course student will be able to

- isolate bacteria by different techniques
- isolate and enumerate bacteria from food samples
- analyse water samples using microbiological techniques
- analyse the chemical properties of foodanalyse the chemical properties of water