

Government Degree College Baramulla

SEMESTER 1st

MAJOR/MINOR COURSE

Subject: Food Science and Technology

Title: FOOD MICROBIOLOGY AND FOOD CHEMISTRY-I

Code: BFS22C101

CREDITS: (4 + 2) THEORY: 04 PRACTICAL: 02

CONTACT HOURS: 64 T + 64 L

Part-1 THEORY (4 CREDITS)

Course Objectives:

- *To acquaint the students with different groups of micro-organisms associated with food.*
- *To introduce students to basic chemistry of foods and the concepts of food composition.*
- *To get knowledge about macronutrients and enzymes, and their impact on food processing.*

Learning outcomes:

After completing the course, the students will be able to:

- *Know the major reactions behind food spoilage*
- *Understand underlying properties and reactions of various food components.*
- *Understand the impact of enzymes on food processing.*

UNIT-1 Introduction to Microbiology

(16 hours)

- Introduction to food microbiology
- Bacteria: Structure and classification
- Fungi: Structure and classification
- Virus: Structure and classification
- Microbial growth curve and Factors affecting microbial growth—extrinsic and intrinsic factors
- Economic importance of bacteria, fungi and virus

UNIT-II Role of Microbes in Food

(16 hours)

- Role of microbes in food industry.
- Food spoilage – physical, chemical and biological.
- Introduction to Food borne diseases- botulism and salmonellosis.
- Concept of probiotics.
- Fermentation and its types.

UNIT-III Introduction to Food Chemistry

(16 hours)

- Food chemistry and its importance.
- Carbohydrates- Definition and classification.
- Proteins- definition and classification.
- Concept of moisture content and water activity.

UNIT-IV Food Components

(16 hours)

- Lipids: Definition and classification.
- Vitamins- Introduction, sources and classification.
- Minerals in foods- Macro-minerals and micro-minerals
- Enzymes: Definition, and their role in food processing.
- Browning reactions in foods-Enzymatic and Non-enzymatic

Books recommended:

1. Food Chemistry by Meyer
2. Food and Nutrition by M. Swaminathan.
3. Food: Facts and Principles by ShakuntalaManay
4. Food Chemistry by O. R. Fennema.
5. Modern Food Microbiology by J. M. Jay.
6. Food microbiology by V. Ramesh
7. A Text Book of Microbiology by Dubey.
8. Food Processing Technology by P.J. Fellows

Part- 2: Laboratory course (Credits: 02)

Course Objectives:

- *To learn about working and handling of Microscope.*
- *To identify and enumerate Microorganisms in food samples.*
- *To prepare solutions of different concentrations*

Learning outcomes:

- *Accomplish the handling of microscope for identification of microorganisms.*
- *Learn various techniques of culturing microorganisms and their enumeration.*
- *Preparation and standardize different solutions.*

Section A: Food Microbiology

1. Microscope: Types and working of microscope
2. Cleaning and sterilization of glassware
3. Identification of different food bacteria, yeast and mould on the basis of morphological characteristics
4. Enumeration of microorganisms in food sample, Total Plate count :Pourplate, Streak and Spread plate technique
5. Gram staining technique

Section B: Food Chemistry

6. Preparation and standardization of solutions
7. Determination of moisture content, ash, protein and crude fat
8. Qualitative tests of carbohydrates.

Books Recommended:

1. James G. Cappuccino, Natalie Sherman *Microbiology: A Laboratory Manual*
2. Maheshwari, D.K. *Practical Microbiology*
3. Gunasekaran, P. *Laboratory Manual in Microbiology*
4. Connie, M. Weaver & James, R. Daniel. *The Food Chemistry Laboratory*