SEMESTER- 5th **Major/ Minor-I**

Subject: Food Science and Technology

Title: Processing Technology of Milk & Milk products **Code: BFS22C501**

CREDITS: (4 + 2) THEORY: 04 PRACTICAL: 02 CONTACT HOURS: 64 T + 64 L

Part-1 THEORY (4 CREDITS)

Course Objectives:

- *To learn about the status and scope of dairy industry.*
- *To introduce the students to processing of milk and milk products.*
- *To learn about preservation and quality evaluation of milk and milk products.*

Learning outcomes:

- *Understand the importance of dairy products in human nutrition.*
- *Ability to process dairy products.*
- *Preparation and preservation of different dairy products.*
- *Quality evaluation of dairy products.*

UNIT- 1 **(16 HOURS)**

- Dairy industry in India and its scope with specific reference to J and K
- Milk: Definition, sources and composition of milk and its nutritive value
- Factors affecting composition of milk
- Chemistry of Milk constituents- fat, proteins, lactose, vitamins &minerals
- Processing of market milk- standardization, homogenization, toning of milk, pasteurization and sterilization

UNIT- 2 **(16 HOURS)**

- Cream: Types, specification, technology of production.
- Butter oil, evaporated milk and condensed milk: Technology of production.
- Technology of Indian dairy products: Ghee, Butter, and Khoa.
- Dried milk and Instantization of milk.

UNIT- 3 **(16 HOURS)**

- Ice creams: Production & its quality control.
- Starter culture production &propagation for fermented milk products.
- Fermented milk products: yoghurt, Dahi, Acidophilus milk and Kefir.
- Cheese: types, & manufacturing process of cheddar cheese, spoilage and its preservation.

UNIT- 4 **(16 HOURS)**

- Storage, transportation and distribution of milk and milk products.
- Assessing and grading milk and its products.
- Packaging of dairy products
- By product utilization.

References

1. Outlines of Dairy Technology by S. K. De
2. Chemistry and Testing of Dairy products by H.V. Atherton & J.A. Newlander
3. Milk and dairy Product Technology by Edger Spreer.
4. Dairy Chemistry by H.H. Sommer
5. Dairy Science and Technology by P. Walstra, Pieter Walstra, Jan T. M. Wouters
6. Advanced Dairy Science and Technology by Trevor Britz, Richard K. Robinson
7. Dairy Science and Technology Handbook: Principles and properties byY. M. Hui
8. Dairy Technology- Practical Guide by Frans Lettink, Hein Valenberg, Kasper Hettinga

Part- 2: Laboratory course (Credits: 02)

- Quantitative estimation of milk constituents such as moisture, total solids and fat.
- Determination of acidity of milk.
- Determination of specific gravity of milk.
- Platform tests on given samples of milk.
- Determination of adulterants in milk–water, urea, starch, sucrose etc.
- Detection of preservatives in milk.
- Preparation of common milk products: Flavoured milks, evaporated milk, condensed milk. yoghurt, dahi, paneer, ice-cream.
- Visit to local milk processing plant.

References

1. Advanced Dairy Science and Technology by Trevor Britz, Richard K. Robinson
2. Dairy Science and Technology Handbook: Principles and properties byY. M. Hui
3. Dairy Technology- Practical Guide by Frans Lettink, Hein Valenberg, Kasper Hettinga
4. Outlines of Dairy Technology by S. K. De
5. Milk and dairy Product Technology by Edger Spreer.

SEMESTER- 5th **MAJOR-2**

Subject: Food Science and Technology

Title: Spices, Flavors and Plantation Crops **Code: BFS22C502**

CREDITS: (4 + 2) THEORY: 04 PRACTICAL: 02 CONTACT HOURS: 64 T + 64 L

Course Objectives:

- *To learn about the composition and processing of spices and plantation crops.*
- *To know about the flavour characterization of spices.*
- *To impart knowledge about the essential oils of spices.*

Learning outcomes:

- *Understand the properties of diverse spices and plantation crops.*
- *Understand the significance of flavour in foods.*
- *Preservation of oleoresins and essential oils by encapsulation.*

UNIT- 1 **(16 HOURS)**

- Production and distribution of spices.
- Spices: Definition, classification and functions.
- Quality specifications for spices.
- Major & minor spices of India: Chemical composition, processing and uses of different spices like saffron, chillies, coriander, turmeric, pepper, cinnamon, cloves, and cardamom.

UNIT- 2 **(16 HOURS)**

- Definition and perception of flavors.
- Chemistry of different flavors.
- Taste Types: Sweet, bitter, sour, salty and umami.
- Major flavouring components of spices: Garlic, and onion.

UNIT- 3 **(16 HOURS)**

- Essential oils and oleoresins.
- Flavor development in thermally processed and fermented food products.
- Introduction to flavor encapsulation & stabilization.

UNIT- 4 **(16 HOURS)**

- Plantation Crops: Definition and export potential.
- Tea: Composition and processing of tea. Different types of tea such as green tea, black tea, oolong tea and Kashmiri kehwa.
- Coffee: Chemical composition, processing, roasting and brewing of coffee.
- Cocoa: Chemical composition, processing of cocoa.

References

1. Handbook of Spices, Seasonings, and Flavorings By Susheela Raghavan
2. Indian Spices: The Legacy, Production and Processing of India's Treasured Export
3. Handbook of Herbs and Spices Volume 3 by K. V. Peter
4. Recent Advances in Food and Flavor Chemistry by Chi-Tang Ho
5. Handbook of Oleoresins: Extraction, Characterization, and Applications by Amir gul
6. Oleoresins: Composition, Chemistry and Applications By Valdir Florêncio da Veiga
7. Essential Oils: Sources, Production and Applications by Charu Arora, Dakeshwar Kumar
8. Plantation Crops by Bhani Ram, Mamta Dall, Anil Sharma
9. Introduction to Spices, Plantation Crops, Medicinal and Aromatic Plants by N. Kumar
10. Production Technology of Spices, Aromatic, Medicinal and Plantation Crops by Swati Barche

Part- 2: Laboratory course (Credits: 02)

- Determination of moisture content in spices.
- Determination of essential oil content in different spices.
- Determination of oleoresin content in various spices.
- Identification of different flavours by sensory evaluation.
- Determination of sensory threshold in different flavours using organoleptic evaluation.
- Detection of adulteration in saffron, chilly and turmeric.
- Determination of antioxidant activity of black and green tea.

References

1. Production Technology of Spices, Aromatic, Medicinal and Plantation Crops by Swati Barche
2. Indian Spices: The Legacy, Production and Processing of India's Treasured Export
3. Handbook of Oleoresins: Extraction, Characterization, and Applications by Amir gul
4. Oleoresins: Composition, Chemistry and Applications By Valdir Florêncio da Veiga
5. Essential Oils: Sources, Production and Applications by Charu Arora, Dakeshwar Kumar