B.Sc. Dairy Science (Vocational Subject)
III Year V Semester
DSE-IA: Technology of Dairy Products - I
Theory Syllabus (4 Credits) 60 Lectures

Unit 1: Reception of milk: Unloading, Grading, Sampling, Testing, Weighing and Recording. Storage of milk. Straining, filtration and clarification of milk. Definition and objectives of Pasteurization of milk, Objections to Pasteurization and Principles of heat exchange. (15)

Unit2: Methods of Pasteurization: LTLT, HTST and Uperization. Sterilization of milk. Factors influencing homogenization, effect of homogenization on milk. Standardization of milk. (15)

Unit 3: Packaging of milk: Desirable characters and types of packaging materials; Forms of packaging. Disposal of dairy effluents: Sources of dairy waste; Necessity of treatment of dairy waste; Methods of treatment: Low cost methods and Conventional methods - Activated sludge process and trickling filters. (15)

Unit 4: Market milk: Toned milk, Double toned milk, Reconstituted milk, Standardized milk and Full cream milk – Standards and methods of manufacture. Cream: Types of cream, composition, methods of cream separation, gravity and centrifugal methods, types of cream separators; factors affecting fat losses in skim milk and fat percentage in cream. (15)

B.Sc. Dairy Science (Vocational Subject)
III Year V Semester
DSE-IA: Technology of Dairy Products - I
Practical Syllabus (1 Credit)

1. RMRD Testing of milk.
2. Standardization of milk.
3. Homogenization of milk.
4. Pasteurization of milk.
5. Sterilization of milk.
6. Preparation of toned milk and double toned milk.
7. Preparation of Reconstituted milk.
8. Cream separation.

Reference Books:

1. Dairy processing handbook – Gosta Bylund.
2. Outlines of Dairy Technology – Sukumar De.
3. Milk products preparation and quality control – C.P. Ananthakrishnan.
4. The technology of milk processing – C.P. Ananthakrishnan.
5. Modern Dairy products – Lincoln M. Lampert.

B.Sc. Dairy Science (Vocational Course)
III Year V Semester
DSE-IB: Dairy Chemistry
Theory Syllabus (4 Credits) 60 Lectures

Unit 1: (a) Composition of milk: Definition of milk, Composition of cow milk, buffalo milk, sheep milk, goat milk and human milk. Differences between the composition of cow and buffalo milks. Constituents of milk: Minor and major constituents.
(b) Colostrums: Significance, Composition, difference between normal milk and colostrums. (15)

Unit 2: Factors affecting composition and yield of milk – Species, Breed, Individuality, Stage of lactation, Age of the animal, Season, Interval between milking, Stage of milking, Feed, Estruses, Exercise, Milker and Drugs. (15)

Unit 3: Physico-chemical properties of milk – Colour, Flavour, Density, Specific gravity, Freezing point, Boiling point, Surface tension, Viscosity, Specific heat, Refractive index, Electrical conductivity, Germicidal property, pH and acidity. (15)

Unit 4: (a) Chemistry of major constituents of milk b) Nutritive value of milk (c) Platform tests**;** Tests for detection of adulteration of milk; Preservatives and Neutralizers.
(d) FSSAI specifications for milk. (15)

B.Sc. Dairy Science (Vocational Subject)
III Year V Semester
DSE-IB: Dairy Chemistry
Practical Syllabus (1 Credit)

1. Estimation of Fat in milk.
2. Estimation of SNF in milk.
3. Estimation of Specific gravity of milk.
4. Estimation of Acidity of milk.
5. Measurement of pH of milk.
6. Measurement of Surface tension of milk.
7. Measurement of Viscosity of milk.
8. Comment on the quality of given milk sample.

Reference Books:

1. Dairy Chemistry and Animal Nutrition – M.M. Roy.
2. Text book of Practical Dairy Chemistry – N.K. Roy.
3. Fundamentals of Dairy Chemistry – Webb Johnson and Alfred.
4. Dairy Chemistry and Physics – Pieter Walstra and Robert Jenner.
5. Fundamentals of Dairy Chemistry – Noble P. Wong.
6. A text book of Dairy Chemistry – Ling, E.R.

B.Sc. III Year
Semester-V
Generic Elective

GE-1 (2 hrs/week) **(2 Credits) Lectures: 30**

Entrepreneurship Development

Unit-I Entrepreneurial Development:

- Case studies of Successful Entrepreneurs.
- Exercises on ways of sensing opportunities – Sources of idea, creating efforts, SWOT Analysis.
- Entrepreneurial skill assessment test.
- Techniques of development of entrepreneurial skills, positive self image and locus of control.

Unit-II Food Business Management:

- Case studies of Food Processing Business and its aspects.
- Business opportunity Identification and Assessment Techniques.
- Business idea generation and evaluation exercise.
- Market Assessment study; Analysis of competitive situation.
- SWOT Analysis for business and competitors.
- Preparation of business plan.
- Preparation of Project Report.
- Methods of arrangement of inputs – Finance and Material.

Recommended Books:

1. Acharya SS and Agarwal NL "Agricultural Marketing in India", Oxford and ISH Publishers Co., New Delhi, 1987.
2. Chandra, Prasanna "Projects, Planning, Analysis, Selection, Implementation and Review", TMH Pub., Co., New Delhi, 1996.
3. David D and Erickson S "Principles of Agribusiness Management" MGH Book Co., New Delhi, 1987.
4. David H. Holt "Entrepreneurship – A new Venture Creation" Prentice Hall of India, New Delhi, 2002.
5. Phillip Kottler "Marketing Management", PHI Pvt. Ltd., New Delhi, 1994.
6. Vasant Desai "The Dynamics of Entrepreneurial Development and Management" Himalaya Publishing House Pvt. Ltd., Mumbai, 2011.
7. Vasant Desai "Fundamentals of Entrepreneurship and Small Business Management" Himalaya Publishing House Pvt. Ltd., Mumbai, 2012.

B.Sc. Dairy Science (Vocational Subject)
III Year VI Semester
DSE-IIA: Technology of Dairy Products - II
Theory Syllabus (4 Credits) 60 Lectures

Unit 1: Butter: PFA Standards, Classification, Composition, Method of manufacture of butter by Creamery butter method, Overrun in butter. Butter oil: Composition, uses and method of manufacture. (15)

Unit2: Cheese**:** PFA Standards, Composition, Classification, method of manufacture of Cheddar cheese and Cottage cheese. Ice cream: BIS Standards, Composition, Classification, Method of manufacture and Overrun in ice cream. (15)

Unit3: Condensed and Evaporated milks: Types of condensed milks, Standards, Composition and method of manufacture. Milk powder: BIS Standards, Types of drying systems, Manufacture of Roller dried and Spray dried milk powder. (15)

Unit 4: Indigenous Milk products: Khoa, Channa, Ghee, Dahi and Kulfi: PFA Standards and method of manufacture. (15)

Note: In-Plant Training for 2 weeks is compulsory during III year VI semester in any of the Dairy plants where there is facility for making wide range of Dairy products. Students need to submit report at the time of VI Semester Practical Examination. (Weightage of 25%)