

4273 – DAIRY TECHNOLOGY										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.	Total		
3	2	5	25	25	3 Hrs	100	-	150		
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total	
4267		FOD		75	25	100	50	-	150	

Rationale- Dairy industry is a major food industry in India; hence knowledge of milk procurement, processing, distribution and technology of milk products is essential. This subject aims at giving the food technician the basic theoretical and practical knowledge, required by a supervisor in the milk or milk processing industry. Sufficient coverage has therefore, been given to market milk, processing and distribution, ice-cream, various indigenous milk products, milk powder, butter, milk based beverages, etc.

COURSE CONTENTS		Hrs	Mks
<b>1. MARKET MILK</b>		4	10
Milk industry in India. Definition of milk, source as food composition and nutritive value. Properties of milk- Physical and chemical.			
<b>2. PROCESSING OF MILK</b>		4	10
Receiving of milk, platform tests, filtration, clarification, cooling, storage, standardisation, pasteurisation, homogenisation, packaging and distribution of milk. Definitions- Standardised milk, single toned, double toned. Manufacture and shelf life of sterile bottled milk and flavoured milk.			
<b>3. CREAM</b>		3	8
Cream separation, cream separator, and methods of cream separation. Factors governing richness of cream, factors governing fat percentage.			
<b>4. BUTTER</b>		5	10
Introduction, composition. Process involved- Cream neutralisation, addition of starter, creams ripening, churning, working of butter, printing, packaging. Factors influencing churning, over-run in butter, butter defects, their causes and prevention.			
<b>5. CHEESE</b>		7	10
Introduction, history, definition, classification, composition, nutritive value, legal standards. Manufacture of processed cheese, Swiss cheese, cottage cheese, their defects and control. Manufacture of cheddar cheese, packaging, marketing, defects of cheese.			
<b>6. CONDENSED MILK</b>		4	10
History, composition, types of condensed milk, method of manufacture, vacuum pan, condensing, defects in condensed milk.			
<b>7. DRY MILK</b>		7	10
History, types of dry milk, composition of each dry milk. Methods of manufacture, drum drying, spray drying, freeze drying, packaging of milk powder. Properties of dry milk, bulk density, solubility, solubility index, wettability, dispersability. Defects in dry milk, reconstitution. Instant milk powder manufacture. Malted milk beverages like Horlicks, Viva, etc.			

**8. ICE-CREAM**

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History, definition, classification, composition, ingredients used-sweeteners, stabilisers, flavours, etc. Preparation of ice-cream, calculation of ice-cream mix, pasteurisation of milk, homogenisation, ageing, freezing and packaging of ice-cream. Defects and over-run in ice-cream.

**9. INDIGENOUS & CULTURED MILK PRODUCTS**

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Rubbery, khoa, channa, rasgulla, ghee, paneer, shrikhand, lassi, kalakand. Methods of preparation and composition. Dahi, yoghurt- their composition, changes in constituents during fermentation and flavour development.

**10. BY-PRODUCTS**

Process of manufacture and uses of by-products, lactose, whey powder and casein.

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**Total**

48 100

**PRACTICALS**

- 1) Platform tests in dairy industry- Acidity, odour, taste, flavour, alcohol, C. O. B.
- 2) Chemical analysis of milk to find adulteration and detecting efficiency of pasteurisation. Test for starch, bicarbonate, glucose, specific gravity of milk, preservatives, acidity, phosphates test, MBR test.

3) Determination of total solids and Solid Non Fat (SNF).	4) Estimation of fat from milk by Gerber butyrometer.
5) Manufacture of dahi and ghee.	6) Manufacture of butter.
7) Manufacture of ice-cream.	8) Demonstration of cream separation in dairy
9) Manufacture of channa.	10) Manufacture of paneer.
11) Manufacture of rubbery.	12) Manufacture of shrikhand.
13) Manufacture of rasgulla.	14)

**REFERENCE BOOKS:**

1. Outlines of Dairy Technology by Sukumar De.
2. Milk and Milk Products by Clarence Henry Eckles.
3. Principles of Dairy Processing by James N. Warner.
4. Milk Production and Processing by Henry F. Judkin.

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