



CVM UNIVERSITY

Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: Bachelor of Technology (Dairy Technology)

Semester: VII

Course Code:

Course Title: By-Product Technology

Course Group: Professional Core Course

Course Objectives: This course focuses on the utilization of dairy Byproducts to enhance sustainability, efficiency and profitability in the industry. Students will gain in depth knowledge of the manufacturing, availability and nutritional value of Byproducts.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
3	-	2	4	50 / 18	50 / 17	25 / 9	25 / 9	150 / 53

* J: Jury; V: Viva; P: Practical

Detailed Syllabus:

SN	Contents	Hours
1	Introduction of dairy by-products By-products and issue involved in their utilization , Global status, availability and utilization of dairy by-products , Indian status, availability and utilization of dairy by-product , Associated economic and pollution problems.	8
2	Skim milk and its by-products : Physico-chemical characteristics of skim milk. Casein: classification & specifications. Basic principles and manufacture of different types of casein. Industrial and food uses of caseins. Manufacture of sodium caseinate and other caseinate & physico-chemical and functional properties and food application. (Manufacture of casein hydrolysates and its industrial application, Enzymatic production of casein hydrolysates, Debittering of protein hydrolysates, Co-precipitates: Introduction and basic principles for production, Manufacture of co-precipitates , Physico-chemical properties of co-precipitates)	09
3	Processing and Utilization of whey Physico-chemical characteristics of whey, Manufacture of condensed whey products, Manufacture of dried whey, Physico-chemical properties and utilization of condensed and dried whey products, Whey beverages, Fermented whey beverages, Electrodialysis process for demineralization, Demineralisation of whey and its utilization, Manufacture of whey protein concentrates by molecular separation processes. Physico-chemical	09



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	properties of whey protein concentrates. Manufacture of crude lactose, Refining of lactose. Uses of lactose. Lactose hydrolysis. Applications of hydrolyzed lactose	
4	Functional properties and Food application of milk protein products Functional properties of whey proteins , Functional properties of casein products , Food application of milk protein products	4
5	Processing, Utilization and Physicochemical characteristics of buttermilk and ghee residue Physico-chemical characteristics of buttermilk and its preservation. Utilization of buttermilk. Ghee-residue characteristics ,Processing and utilization	7
6	Nutritional characteristics of byproducts Nutritional characteristics of skim milk and its by-products, buttermilk & ghee-residue. Nutritional characteristics of whey and its by-products	5
	Total	42

List of Practicals:

Sr. No.	Experiment Title
1.	Manufacture of edible casein from cow and buffalo milk
2.	Manufacture of dried whey.
3.	Manufacture of coffee whitener
4.	Manufacture of whey drinks
5.	Manufacture of sodium caseinate
6.	Manufacture of whey proteins
7.	Chemical analysis of edible casein
8.	Chemical analysis of Whey Butter milk and Casein
9.	Manufacture of lactose
10.	Study of ultra-filtration process for concentration

Reference Books:

1	Pieter Walstra . Dairy Science and Technology
2	Bijoy kumar Sarkar . Dairy technology : The Milky Way
3	De, Sukumar (1980). Outlines of dairy technology, Oxford University Press, Delhi.
4	Banks,J.M. TheTechnology of Dairy products .2 nd ed.R. Early(Ed.),Chapman and Hall, Blackie Academic and Professional , London

Supplementary learning Material:

1	https://courseonline.iasri.res.in/course/view.phd?id=112
2	https://agrimoon.com/dairy-technology-icar-ecourse-pdf-books/

Pedagogy: Following one or more points can be incorporated as relevant pedagogy methods.

- Direct classroom teaching
- Audio Visual presentations/demonstrations



- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Seminar/Poster Presentation
- Industrial/ Field visits
- Course Projects

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating
R	U	A	N	E	C	
15%	15%	20%	15%	20%	15%	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	To understand the global importance and utilization of by-product technology.	20
CO-2	To understand the manufacturing, and industrial characteristics of skim milk and it's by product.	25
CO-3	To understand the manufacturing, utilization and physicochemical characteristics of whey and its product.	25
CO-4	To examine the food application and functional properties of milk protein products. To examine the processing , utilisation , physicochemical and nutritional characteristics of buttermilk , ghee residue , whey and its by-product	30

Curriculum Revision:

Version:	2.0
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025