AMITY UNIVERSITY

UTTAR PRADESH

L	T	P/S	SW/ FW	TOTAL CREDIT UNITS
4	-	2	-	05

Course Title: ADVANCED DAIRY TECHNOLOGY

Course Code:

Credit Units: 05

Course Objectives:

To disseminate knowledge about special characteristics of milk, collection and processing of fluid milk and manufacturing processes for important indigenous and modern dairy products.

Pre-requisites:

Fundamental understanding and knowledge of food science.

Student Learning Outcomes:

On completion of the course the student will be able to:

1. explain the advanced processing techniques used in dairy industry.
2. analyze the effect of various processing techniques on the quality of milk and milk products.
3. discuss and plan the by-product utilization in dairy industry.
4. demonstrate the processing of milk and milk based products.
5. work on the formulation of various milk products.

Pedagogy for Course Delivery:

The course pedagogy will include lectures, discussion on applications of the topics covered.

Course Contents/Syllabus:

	Weightage (%)
Module I: Technology of Fluid Milk	**20%**
• Fluid Milk- Definition, composition, • physico-chemical and nutritional properties of milk and its constituents; • Liquid milk processing-filtration/clarification, standardization, homogenization and pasteurization of milk; • Platform tests for raw milk; standards and quality tests for market milk;	

• Special milks; • HACCP in milk industry; CIP system, detergency	
Module II: Technology of Cream, Butter and Ghee	**10%**
• Cream- Types of cream, composition and production methods; Cream separator; Ripening of cream; Defects in cream • Butter- Composition and production methods; Factors affecting churnability of cream, Defects in butter • Ghee- Production of butter oil / ghee, Defects in ghee.	
Module III: Technology of Frozen Milk Products	**20%**
• Ice Cream- Classification, manufacture of ice cream; Packaging, and storage of ice cream; Defects in ice cream and their control. • Other Frozen Products- Definition & Production of Kulfi, ices, sherbets and other frozen milk products	
Module IV: Technology of Cheese and Fermented Milk Products	**15%**
• Cheese: classification, manufacture of cheddar cheese, mozzarella cheese, etc.; defects in cheese and their control • Other Fermented Products- Production, packaging and storage of fermented milks, i.e., dahi, cultured butter milk, yoghurt, acidophilus milk, kumiss, kefir, etc	
Module V: Technology of Evaporated and Dried Milk	**15%**
• Evaporated and Condensed milk- Definition, composition and standards; Manufacturing methods, Defects and their control • Milk powder:Definition, standards, Manufacturing methods, quality, packaging and storage, Defects and their control. • Baby foods- Definition, Production of Baby foods.	
Module VI: Technology of Indigenous Milk Products	**10%**
• Definition and practices for manufacture and storage of khoa, channa, paneer and sweets based on them; • rabri, shrikhand and other milk based sweetmeats	
Module VII: By-product utilization of dairy industry	**10%**
• Whey processing; • lactose production; • use of membrane processes, co-precipitates	

List of experiments:

1. Determination of specific gravity, acidity, moisture, % TS, ash and fat.
2. Performance of platform tests on given sample of milk.
3. Preparation of toned/ flavoured milk.
4. Cream separation and standardization.
5. Preparation and grading of butter/ghee.
6. Preparation of cheese/paneer.
7. Preparation of ice-cream/ices.

8. Determination of moisture content, reconstitution and bulk density of milk powders.
9. Detection of adulterants in milk.
10. Visit to a dairy industry to study commercial scale processing of milk and milk products.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	End Term Examination(%)
75	25	100

Assessment/ ExaminationScheme:

	Continuous Assessment/ Internal Assessment				End Term Examination			Total
Theory Assessment	**CT**	**S/V/Q**	**HA**	**A**	**EE**			**TT**
Weightage (%)	10	08	07	05	70			100
Practical Assessment	**LR**	**P**	**V/Q/P**	**A**	**WT**	**V**	**P**	**TP**
Weightage (%)	10	10	05	05	20	20	30	100

Abbreviations: CT – Class Test, S- Seminar, V- Viva, Q- Quiz, HA- Home Assignment, TT- Total Theory, LR- Lab record, WT- Written Test, P – Performance, TP- Total Practical

The total marks (out of 100) shall be the weighted average of TT and TP in the ratio of theory and lab credit units, say 3:1.

Text&References:

- Earle,R. Technology of Dairy products
- Varnam A H and Sutherland J P. Milk and milk products: Technology, chemistry and microbiology.
- Jensen, RG. Handbook of Milk Composition. Academic Press. California
- Warner IN. Principles of Dairy Processing
- Fellows, P. Food Processing Technology, Elliss Horwood Ltd., Chichester, UK.
- Burton,H. Ultra-high temperature processing of milk and milk products, Elsevier Applied Sciences Ltd., England.
- Zadow,J.G. Whey and lactose processing, Elsevier Applied Sciences Ltd., London.
- De, Sukumar, Outlines of Dairy Technology. Oxford University Press, Oxford
- Eckles, Combs and Macy. Milk and Milk Products