Savitribai Phule Pune University

Anekant Education Society's

TULJARAM CHATURCHAND COLLEGE, BARAMATI, DIST-PUNE – 413102

Syllabus

For

B. Voc.

(Dairy Technology)

T. Y. Semester VI (2022 Pattern)

Sponsored by

University Grant Commission

Under

National Skill Qualification Framework (NSQF)

To be implemented from

2024-25

Title of the Course: B. Voc. (Dairy Technology)
(To be implemented from Academic Year –2024-25)

Course structure:

- B.Voc. is three-year course with three theory and three practical courses in each semester**.**
- Each theory course will be of four credits and each credit is of 15 periods
- Each practical course will be of six credits and each credit is of 15 periods
- Each period is of one clock hour.
- In each practical course there will be one visit to the relevant industry/ institute.
- In addition to the regular practical's based on the theory course, special emphasis will be on communications and soft skills development of the students.

Eligibility:

1) **First Year B.Voc. (Diploma):** A student who has passed the Higher Secondary School Certificate (10+2) in any stream or its equivalent examination
2) **Second Year B.Voc. (Advanced diploma):** Keeping terms of First Year of B. Voc. and if they fulfil the eligibility conditions.
3) **Third Year B.Voc. (Degree):** Student shall pass all First Year B. Voc. courses and satisfactorily keeping terms of Second Year of B. Voc.

Note: Admissions will be given as per the selection procedure / policies adopted by the college, in accordance with conditions laid down by the Savitribai Phule Pune University, Pune.

Examination Pattern:

Examination:

- **Pattern of Examination**
  i) Internal exam, Term end exam, Oral, Project, Presentation, GD, Viva voce
  ii.) Pattern of the question paper:
    i) 25% Objective Question
    II) 50% Short and Long Answer type question
    iii) 25% Problem based Case Study/long answer type
- **Theory Examination: -**
  i) Continuous Internal Assessment: 50 Marks (Unit Test I & II, Assignment-2 No., Attendance) for each course of programme.
  ii) Semester End Examination: 50 Marks on the basis of Answer Sheet Evaluation for each course
- **Practical Examination: -**
  i) Continuous Internal Assessment: 75 Marks (Visit Report, Journal, Viva Voce, Seminar/Presentation, Group Discussion and Attendance) for each course.
  ii) Semester End Examination: 75 Marks on the basis of Answer Sheet Evaluation with performance in practical examination which will be evaluated by external examiner for each course.

Anekant Education Society's
TULJARAM CHATURCHAND COLLEGE, BARAMATI, DIST-Pune-413102
Dairy Technology (B. Voc. Programme)

Sub. Code	Semester-I	Credits	Marks
	Theory (General Education Component)		
UBDT-111	Dairy Development	04	100
UBDT-112	Dairy Farm Management	04	100
UBDT-113	Dairy Chemistry	04	100
	Practical(Skill component)		
UBDT-111-1	Dairy Farm Management	06	150
UBDT-111-2	Dairy Chemistry	06	150
UBDT-111-3	Soft Skill Development	06	150
	Total	**30**	**750**
	Semester-II		
	Theory (General Education Component)		
UBDT-121	Food Technology	04	100
UBDT-122	Market Milk	04	100
UBDT-123	Microbiology of Milk and Milk Products	04	100
	Practical(Skill component)		
UBDT-121-1	Food Technology	06	150
UBDT-121-2	Microbiology of Milk and Milk Products	06	150
UBDT-121-3	Computer Skills	06	150
	Total	**30**	**750**
	Total First Year	**60**	**1500**
Sub. Code	**Semester-III**	**Credits**	**Marks**
	Theory (General Education Component)		
UBDT-231	Dairy Processing Equipment	04	100
UBDT-232	Fermented Milk Products	04	100
UBDT-233	Nutrition Science	04	100
	Practical		
UBDT-231-1	Dairy Processing Equipment	06	150
UBDT-231-2	Fermented Milk Products	06	150
UBDT-231-3	Nutrition Science	06	150
	Total	**30**	**750**
	Semester-IV		
UBDT- 241	Dairy Engineering	04	150
UBDT-242	Traditional Indian Dairy Products	04	150
UBDT-243	Food Safety, Hygiene & Sanitation	04	150
	Practical (Skill Based Component)		
UBDT-241-1	Dairy Engineering	06	150
UBDT-241-2	Traditional Indian Dairy Products	06	150
UBDT-241-3	Food Safety, Hygiene & Sanitation	06	150
	Total	**30**	**750**
	Total Second Year	**60**	**1500**

Sub. Code.	Semester-V	Credits	Marks
	Theory (General Education Component)		
UBDT-351	Quality Assurance and Waste management	04	100
UBDT-352	Fat Rich Milk Products	04	100
UBDT-353	Dairy Plant Management	04	100
	Practical (Skill Based Component)		
UBDT-351 - 1	Quality Assurance and Waste management	06	150
UBDT-351 - 2	Fat Rich Milk Products	06	150
UBDT-351 - 3	Project	06	150
	Total	**30**	**750**
	Semester-6		
UBDT-361	Dairy Product Development	04	100
UBDT-362	Packaging Technology	04	100
UBDT-363	Entrepreneurship Development	04	100
	Practical (Skill Based Component)		
UBDT-361-1	Dairy Product Development	06	150
UBDT-361-2	Packaging Technology	06	150
UBDT-361-3	In-Plant Training	06	150
	Total	**30**	**750**
	Total Final Year	**60**	**1500**
	Total for three years	**180**	**4500**

Note:

- One compulsory visit to field/industry/institute for each practical papers in all semesters
- Report Submission and PPT presentation of visit report is mandatory
- Seminar Report preparation and PPT presentation mandatory for each theory papers.
- Group discussion/case study based on local/regional/national social economic aspects.

B. Voc. Third Year Paper No. UBDT-361 Semester VI

Dairy Product Development (Theory-General Education)

Maximum Marks: 100 Credits: 4

Teaching Period: 4/Week Teaching Load: 60 Theory Period/Semester

Course Objectives:

- To understand the different types of milk and their making procedures, compositions and use.
- To learn about frozen dairy products, their making procedure and technology used in making.
- To study difference between ice-cream and frozen dairy dessert.
- To study process of production of dried milk.
- To study and understand the working of spray and roller drier.
- To acquire knowledge about by-products in dairy industry.
- To study about different types of milk

Course Outcomes:

1. Students will understand the dried milk products in the economy.
2. They will understand the process of production of dried milk.
3. They will understand the difference between ice-cream and frozen dairy dessert.
4. They will understand the working of spray and roller drier.
5. They will get information about by product in dairy industry.
6. They will learn about the principle and working behind spray drying.
7. They will learn about different types of milk.

Weightage:1=weakorlowrelation,2=moderateorpartialrelation,3=strongordirectrelation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3		2	3	3	2			
CO2	3	3	2						3
CO3	3		3						
CO4		3		3			1		
CO5	3	3	3	3				3	
CO6	3	3	3						
CO7	3		3		2		1		

Justification for the mapping

PO1: Disciplinary Knowledge:

CO1: Demonstrate a comprehensive understanding of the economic significance of dried milk products..

CO2: Apply critical thinking skills to analyze the production process of dried milk.
CO3: Differentiate between ice-cream and frozen dairy dessert, showcasing critical reasoning abilities.
CO5: Articulate information on by-products in the dairy industry with clarity..
CO6: Investigate and present principles and workings behind spray drying in the production of dried milk.
CO7: Explore and present information on different types of milk through research.

PO2: Critical Thinking and Problem Solving:
CO2: Apply critical thinking skills to analyze the production process of dried milk.
CO4: They will understand the working of spray and roller drier.
CO5: Articulate information on by-products in the dairy industry with clarity
CO6: Investigate and present principles and workings behind spray drying in the production of dried milk.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:
CO1: This can be Demonstrate especially through presentations a comprehensive understanding of the economic significance of dried milk products..
CO2: Apply critical thinking skills especially through presentations to analyze the production process of dried milk.
CO3: Through reports, Differentiate between ice-cream and frozen dairy dessert, showcasing critical reasoning abilities.
CO5: This can be through Articulate information on by-products in the dairy industry with clarity..
CO6: Investigate and present principles and workings behind spray drying in the production of dried milk.
CO7: Explore and present information on different types of milk through research.

PO4: Research-Related Skills:
CO1: This can be Demonstrate especially through presentations a comprehensive understanding of the economic significance of dried milk products..
CO4: They will understand the working of spray and roller drier.
CO5: This can be through articulate information on by-products in the dairy industry with clarity.

PO5: Personal and Professional Competence:
CO1: Develop personal competence by understanding the economic and industrial aspects of dried milk products.
CO7: Enhance professional competence by gaining knowledge about the diverse applications of milk in various forms.

PO6: Effective Citizenship and Ethics:
CO1: Assess the ethical considerations in the dairy industry, particularly concerning the production of dried milk.

PO7: Environment and Sustainability:
CO4: Communicate effectively about the functioning of spray and roller driers in the dairy industry.
CO7: Explore and present information on different types of milk through research..

PO8: Self-directed and Life-long Learning:
CO5: Cultivate self-directed learning habits by continuously updating knowledge about the dairy industry and its products.

PO9: Trans-disciplinary Research Competence:
CO2: Apply knowledge to analyze the production process of dried milk.

Topics:
Unit 1- Condensed Milks-Definition, concept, manufacturing process, judging, grading and defects of condensed milk **12 Periods**

Unit 2 Dried Milk Products-Definition, Composition, Classification, Standards and principles of drying, changes during drying, advantages and disadvantages of drying, , infant baby food, SMP, WMP, WPC, Ice cream mix powder **12 Periods**

Unit 3 Ice Cream: Definition, Composition, Classification and Standards (Legal and Others) Principle and Method of Manufacture. Technology used in ice cream making **12 Periods**

Unit 4- Frozen Dairy Deserts: Definition, Composition, Classification and Standards (Legal and Others) Principle and Method of Manufacture **12 Periods**

Unit-5By – Products: Skim Milk – Casein and Caseinates, Whey – Whey Beverages, Whey Powder, Lactose, Whey Protein Concentrates, Buttermilk and Ghee Residue, New Technologies in By-product Utilization (Membrane Processing – Reverse Osmosis and Ultra Filtration) **12 Periods**

References-

1. Ice Cream 4th Edition – Arbuckle W.S. (1986)
2. Ice Cream: Manufacture and Technology- Bhandari Vivek (2001)
3. By Products from milks – Webb B.H. (1970)
4. Outlines of Dairy Technology, (1980) Sukumar De

B. Voc. Third Year Paper No. UBDT-362 Semester V

Packaging Technology (Theory-General Education)

Maximum Marks: 100 Credits: 4

Teaching Period: 4/Week Teaching Load: 60 Theory Period/Semester

Course Objectives:

- To study about packaging material used in dairy industry.
- To study about packaging machines & it's working.
- To study and understand the different packaging systems used in dairy industry.
- To study role and function of packaging materials towards food.
- To study different packaging systems based on different products.
- To study identification of packaging material.
- To study about testing of different packaging materials.

Course Outcomes:

1. Students will get an exposure towards packaging material used for dairy products
2. They will know the identification and testing of packaging material
3. They will acquire information about packaging machines & it's working
4. They will understand the different packaging systems used in food industry.
5. They will learn about the role and function in food and dairy industry.
6. They will study about different types of packaging material used in food and dairy industry.
7. They will learn about different packaging system used to packed different products.

Weightage:1=weakorlowrelation,2=moderateorpartialrelation,3=strongordirectrelation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3		3				3	3	
CO2	3	3	3	3			2	3	
CO3									
CO4	3	3		3			3	3	
CO5		3	2		2				
CO6	3			3	2		3	3	
CO7	3	3					3		

Justification for the mapping

PO1: Disciplinary Knowledge:

CO1: Gain expertise in the various packaging materials utilized in the dairy industry.

CO2: They will know the identification and testing of packaging material.

CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.
CO7: Explore sustainable practices in packaging systems, aligning with environmental concerns.

PO2: Critical Thinking and Problem Solving:
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: They will understand the different packaging systems used in the food industry.
CO5: Understand the role and functions of packaging in the context of the food and dairy industry, fostering personal and professional competence.
CO7: Explore sustainable practices in packaging systems, aligning with environmental concerns.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:
CO1: Gain expertise in the various packaging materials utilized in the dairy industry.
CO2: They will know the identification and testing of packaging material.
CO5: Understand the role and functions of packaging in the context of the food and dairy industry, fostering personal and professional competence.

PO4: Research-Related Skills:
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.
CO4: Gain trans-disciplinary insights into the packaging systems used for different food products.

PO5: Personal and Professional Competence:
CO5: Understand the role and functions of packaging in the context of the food and dairy industry, fostering personal and professional competence.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.

PO7: Environment and Sustainability:
CO1: Gain expertise in the various packaging materials utilized in the dairy industry.
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.

CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.
CO7: Explore sustainable practices in packaging systems, aligning with environmental concerns.

PO8: Self-directed and Life-long Learning:
CO1: Gain expertise in the various packaging materials utilized in the dairy industry. CO2: They will know the identification and testing of packaging material.
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.

Topics:

Unit-1: Introduction, Protection of Food products - major role of food packaging - Functions of packaging, Need for protective packaging. Packaging requirements and selection of packaging materials; Types of Container, packaging materials and Forms: Paper and Glass

Unit-2: Metals: Tinplate containers, tinning process, components of tinplate, tin free steel (TFS), types of cans, aluminum containers, lacquers; Plastics: types of plastic films, laminated plastic materials, co-extrusion, edible films, biodegradable plastics.

Unit-3: Test for Packaging Materials, their methods of testing and evaluation; Barrier properties of packaging materials: Theory of permeability, factors affecting permeability, permeability coefficient, gas transmission rate (GTR) and water vapor transmission (WVTR) rate and its measurement

Unit-4: Food packaging systems: Different forms of packaging such as rigid, semi rigid, flexible forms and different packaging system for (a) dehydrated foods (b) frozen foods (c) dairy products (d) fresh fruits and vegetables (e) meat, poultry and sea foods.

Unit-5: Vacuum, CA and MA packaging systems, gas packaging machine; seal and shrink packaging machine; form and fill sealing machine; aseptic packaging systems; bottling machines; carton making machines.

B. Voc. Third Year Paper No. UBDT-363 Semester VI

Entrepreneurship Development (Theory-General Education)

Maximum Marks: 100 Credits: 4

Teaching Period: 4/Week Teaching Load: 60 Theory Period/Semester

Course Objectives:

- To understand the concept of entrepreneurship.
- To learn key skills for being a successful entrepreneur.
- To study qualities of an Entrepreneur.
- To study concept of entrepreneurship.
- To understand the laws and regulations for the industries.
- To gain basic knowledge and guidance for start-up.
- To gain information of all the institutes working for entrepreneurial support

Course Outcomes:

1. Students will get some basic guidance for their start-up.
2. They will be aware of all the institutes working for entrepreneurial support.
3. They will be able to structure their project reports.
4. They will understand the C and traits needed for entrepreneurship.
5. They will be educated towards laws and regulations for the industries.
6. They will understand concept of entrepreneurship.
7. They will learn skills for being a successful entrepreneur.

Weightage:1=weakorlowrelation,2=moderateorpartialrelation,3=strongordirectrelation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1				3					3
CO2								3	
CO3			2	3					
CO4		3			3				
CO5						3			
CO6	3							3	
CO7		3			3				

Justification for the mapping

PO1: Disciplinary Knowledge:

CO6: Gain a comprehensive understanding of the concept of entrepreneurship as a part of their disciplinary knowledge.

PO2: Critical Thinking and Problem Solving:
CO4: Enhance problem-solving abilities by recognizing the qualities and traits essential for entrepreneurship.
CO7: Learn skills for becoming a successful entrepreneur, contributing to personal and professional competence.

PO3: Social Competence - Exhibit thoughts and ideas effectively in writing and orally:
CO3: Acquire skills in structuring project reports, demonstrating proficiency in research-related competencies.

PO4: Research-Related Skills:
CO3: Acquire skills in structuring project reports, demonstrating proficiency in research-related competencies.
CO1: Enhance trans-disciplinary research competence by gaining insights into various domains related to entrepreneurship.

PO5: Personal and Professional Competence:
CO4: Enhance problem-solving abilities by recognizing the qualities and traits essential for entrepreneurship.
CO7: Learn skills for becoming a successful entrepreneur, contributing to personal and professional competence.

PO6: Effective Citizenship and Ethics:
CO5: Be educated on laws and regulations pertinent to industries, fostering a sense of ethical entrepreneurship and effective citizenship.

PO8: Self-directed and Life-long Learning:
CO2: Develop critical thinking skills by becoming aware of all the institutes providing entrepreneurial support.
CO6: Develop self-directed and life-long learning skills through exposure to various aspects of entrepreneurship and its continuous evolution.

PO9: Trans-disciplinary Research Competence:
CO1: Enhance trans-disciplinary research competence by gaining insights into various domains related to entrep

Topics:

Unit-1: Entrepreneurship: Introduction, Entrepreneurs (Concept), Technical Entrepreneurs, Need of the Entrepreneurship development, Quality of an entrepreneurs, rewards and penalties for an entrepreneur, characteristics and traits of an entrepreneurs. **12 Periods**

Unit-2: Entrepreneurial Support System: Introduction, Sources of Information, Application forms, District Industry Centre (DICs), Role of commercial bank for financial assistant, SISI, NSIC, SIDBI and NABARD. **12 Periods**

Unit-3: Project Report Preparation: Introduction, Preliminary project report, Techno-economic Feasibility Report, Detailed Project Report (DPR), Project Viability and Project Appraisal. **12 Periods**

Unit-4: Market Survey and Opportunity Identification: Business Planning, Personal Quality as an entrepreneurs, Procedure for starting small scale industry, Identification of Business Opportunity, Process of final product selection **12 Periods**

Unit-5 Legal Aspect of small business: Introduction, Principal of Taxation, Factory Act, 1948, **Environmental considerations:** Introduction, concept of Ecology and Environment, Environmental, Water and Air Pollution Factors. Safety at work place and Personal Protection Equipment. **12 Periods**

References-

- Entrepreneurship development and Management, R.K.Singal, S.K.Kataria and Sons.
- Developing Entrepreneurship, Pareek& Co. Learning systems,Delhi
- Entrepreneurship & Venture – Management, Clifford and Bombak, Joseph R. Momanso.
- Planning an Industrial unit, J. N. Vyas.

B. Voc. Third Year Paper No. UBDT-361 - 1 Semester V

Dairy Product Development (Practical-Skill Component)

Maximum Marks: 150 Credits: 6

Teaching Period: 2/Week Teaching Load: 24 practical/Semester (4 Period Each)

Course Objectives:

1. To prepare and study different types of milks and it's processing.
2. To understand the different types of milk and their making procedures, compositions and use.
3. To learn about frozen dairy products, their making procedure and technology used in making.
4. To study difference between ice-cream and frozen dairy dessert.
5. To study process of production of dried milk.
6. To study and understand the working of spray and roller drier and prepare SMP/WMP.
7. To acquire knowledge about by-products in dairy industry and study preparation of whey beverages.

Course Outcomes:

1. Students will understand the importance of dried milk products.
2. They will understand the process of production of dried milk.
3. They will understand the principle and manufacturing of ice- cream.
4. They will learn working and principle of spray and roller drier.
5. They will learn about by products in dairy industry.
6. They will study to prepare different types of milks and its processing.
7. They will learn about preparation whey powder and whey beverages.

Weightage:1=weakorlowrelation,2=moderateorpartialrelation,3=strongordirectrelation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3		2	3	3	2			
CO2	3	3	2						3
CO3	3		3						
CO4		3		3			1		
CO5	3	3	3	3				3	
CO6	3	3	3						
CO7	3		3		2		1		

Justification for the mapping

PO1: Disciplinary Knowledge:

CO1: Demonstrate a comprehensive understanding of the economic significance of dried milk products..
CO2: Apply critical thinking skills to analyze the production process of dried milk.
CO3: Differentiate between ice-cream and frozen dairy dessert, showcasing critical reasoning abilities.
CO5: Articulate information on by-products in the dairy industry with clarity..
CO6: Investigate and present principles and workings behind spray drying in the production of dried milk.
CO7: Explore and present information on different types of milk through research.

PO2: Critical Thinking and Problem Solving:
CO2: Apply critical thinking skills to analyze the production process of dried milk.
CO4: They will understand the working of spray and roller drier.
CO5: Articulate information on by-products in the dairy industry with clarity
CO6: Investigate and present principles and workings behind spray drying in the production of dried milk.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:
CO1: This can be Demonstrate especially through presentations a comprehensive understanding of the economic significance of dried milk products..
CO2: Apply critical thinking skills especially through presentations to analyze the production process of dried milk.
CO3: Through reports, Differentiate between ice-cream and frozen dairy dessert, showcasing critical reasoning abilities.
CO5: This can be through Articulate information on by-products in the dairy industry with clarity..
CO6: Investigate and present principles and workings behind spray drying in the production of dried milk.
CO7: Explore and present information on different types of milk through research.

PO4: Research-Related Skills:
CO1: This can be Demonstrate especially through presentations a comprehensive understanding of the economic significance of dried milk products..
CO4: They will understand the working of spray and roller drier.
CO5: This can be through articulate information on by-products in the dairy industry with clarity.

PO5: Personal and Professional Competence:
CO1: Develop personal competence by understanding the economic and industrial aspects of dried milk products.

CO7: Enhance professional competence by gaining knowledge about the diverse applications of milk in various forms.

PO6: Effective Citizenship and Ethics:
CO1: Assess the ethical considerations in the dairy industry, particularly concerning the production of dried milk.

PO7: Environment and Sustainability:
CO4: Communicate effectively about the functioning of spray and roller driers in the dairy industry.
CO7: Explore and present information on different types of milk through research..

PO8: Self-directed and Life-long Learning:
CO5: Cultivate self-directed learning habits by continuously updating knowledge about the dairy industry and its products.

PO9: Trans-disciplinary Research Competence:
CO2: Apply knowledge to analyze the production process of dried milk.

Topics and Learning

1. Preparation of flavoured milk
2. Preparation of condensed milk
3. Preparation of Ice cream
4. Preparation of Kulfi
5. Preparation of SMP by spray drying
6. Preparation of SMP by spray drying
7. Preparation of Infant baby food
8. Preparation of rehydrated milk
9. Preparation of recombinant Milk
10. Preparation of whey powder
11. Preparation of whey beverages
12. Preparation of Ice-cream mix powder
13. Visit report

B. Voc. Third Year Paper No. UBDT-361 - 2 Semester V

Packaging Technology (Practical-Skill Component)

Maximum Marks: 150 Credits: 6

Teaching Period: 2/Week Teaching Load: 24 practical/Semester (4 Period Each)

Course Objectives:

- To study about packaging material used in dairy industry.
- To study about packaging machines & it's working.
- To study and understand the different packaging systems used in dairy industry.
- To study role and function of packaging materials towards food.
- To study different packaging systems based on different products.
- To study identification of packaging material.
- To study about testing of different packaging materials.

Course Outcomes:

1. Students will get an exposure towards packaging material used for dairy products
2. They will know the identification and testing of packaging material
3. They will acquire information about packaging machines & its working
4. They will understand the different packaging systems used in food industry.
5. They will study about different packaging material.
6. They will study about different packaging machines.
7. They will learn to prepare album of different types of packaging material.

Weightage:1=weakorlowrelation,2=moderateorpartialrelation,3=strongordirectrelation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3		3				3	3	
CO2	3	3	3	3			2	3	
CO3									
CO4	3	3		3			3	3	
CO5		3	2		2				
CO6	3			3	2		3	3	
CO7	3	3					3		

Justification for the mapping

PO1: Disciplinary Knowledge:

CO1: Gain expertise in the various packaging materials utilized in the dairy industry.

CO2: They will know the identification and testing of packaging material.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.
CO7: Explore sustainable practices in packaging systems, aligning with environmental concerns.

PO2: Critical Thinking and Problem Solving:
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: They will understand the different packaging systems used in the food industry.
CO5: Understand the role and functions of packaging in the context of the food and dairy industry, fostering personal and professional competence.
CO7: Explore sustainable practices in packaging systems, aligning with environmental concerns.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:
CO1: Gain expertise in the various packaging materials utilized in the dairy industry.
CO2: They will know the identification and testing of packaging material.
CO5: Understand the role and functions of packaging in the context of the food and dairy industry, fostering personal and professional competence.

PO4: Research-Related Skills:
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.
CO4: Gain trans-disciplinary insights into the packaging systems used for different food products.

PO5: Personal and Professional Competence:
CO5: Understand the role and functions of packaging in the context of the food and dairy industry, fostering personal and professional competence.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.

PO7: Environment and Sustainability:
CO1: Gain expertise in the various packaging materials utilized in the dairy industry.
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.

CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.
CO7: Explore sustainable practices in packaging systems, aligning with environmental concerns.

PO8: Self-directed and Life-long Learning:
CO1: Gain expertise in the various packaging materials utilized in the dairy industry. CO2: They will know the identification and testing of packaging material.
CO2: Demonstrate analytical skills in the identification and testing of packaging materials.
CO4: Conduct research to comprehend the diverse packaging systems employed in the food industry.
CO6: Recognize ethical considerations in the use of different packaging materials in the food and dairy industry, promoting responsible citizenship.

Topics and Learning

1) Identification and testing of packaging materials
2) Determination of wax from wax paper;
3) Testing of lacquered tin plate sheets;
4) Measurement of tin
5) Determination of equilibrium moisture content;
6) Grading of glass bottles for alkalinity;
7) Determination of water vapour transmission rate of packaging material;
8) To perform vacuum packaging of food sample and carry out its storage study;
9) Testing the compression strength of the boxes;
10) Packaging the food material in seal and shrink packaging machine and study its shelf life;
11) Testing the strength of glass containers by thermal shock test; Testing the strength of filled pouches by drop tester.
12) Preparation of album of different types of packaging.
13) Visit to industry
14) Preparation of visit report & presentation

B. Voc. Third Year Paper No. UBDT-361 - 3 Semester V

In-Plant Training (Practical-Skill Component)

Maximum Marks: 150 Credits: 6

Teaching Period: 2/Week Teaching Load: 24 practical/Semester (4 Period Each)

Course Outcomes:

1. Students will get exposed to the aspects of dairy management.
2. They will understand the practical working of a dairy industry.
3. They can illustrate important factors of dairy development.
4. They will be able to demonstrate effective management.
5. They will learn about professional protocols of industrial work.
6. They will get hands on experience on various aspects of dairy and food industries.

Course Objectives:

They will learn and understand the actual processing of milk and milk products in dairy industries.

Students should undergo a project work for a period of 90 days, during the Six Semester. The programme is arranged by the Department of Food Technology and Research in consultation with the Dairy/Food industries. The purpose of the programme is to get hands-on experience on various aspects of Dairy/Food industries that form the strong foundation for the young Dairy/Food technologists. The department will allot students to the industry, in consultation with the industry concerned. Student should report for the programme on the stipulated date. On completion, each student should prepare a project report duly certified by the supervisor in the industry. Consequently, a seminar should be conducted in the department to present the finding of the project work. The bonafide project report attested by the head of the department will be evaluated by the external and internal examiner and a viva voce will be conducted.

Weightage:1=weakorlowrelation,2=moderateorpartialrelation,3=strongordirectrelation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3							3	3
CO2	3								3
CO3	3								3
CO4		3		3					3
CO5		3			3	3			
CO6			3					3	
CO7			3	3		3			3

Justification for the mapping

PO1: Disciplinary Knowledge:

CO1. Gain proficiency in various aspects of dairy management.
CO2. Acquire a comprehensive understanding of the practical operations within the dairy industry.
CO3. Illustrate critical factors influencing the development of the dairy sector.

PO2: Critical Thinking and Problem Solving:
CO4. Demonstrate effective problem-solving and management skills in the context of dairy operations.
CO5. Communicate thoughts and ideas related to dairy management both in writing and orally.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:
CO6. Learn and apply professional protocols essential for industrial work in the dairy sector.
CO7. Develop research skills relevant to the dairy and food industries.

PO4: Research-Related Skills:
CO4. Demonstrate effective problem-solving and management skills in the context of dairy operations.
CO7. Develop research skills relevant to the dairy and food industries.

PO5: Personal and Professional Competence:
CO5. Communicate thoughts and ideas related to dairy management both in writing and orally.

PO6: Effective Citizenship and Ethics:
CO5. Communicate thoughts and ideas related to dairy management both in writing and orally.
CO7. Develop research skills relevant to the dairy and food industries.

PO8: Self-directed and Life-long Learning:
CO1. Gain proficiency in various aspects of dairy management.
CO6. Learn and apply professional protocols essential for industrial work in the dairy sector.

PO9: Trans-disciplinary Research Competence:
CO1. Gain proficiency in various aspects of dairy management.
CO2. Acquire a comprehensive understanding of the practical operations within the dairy industry.
CO3. Illustrate critical factors influencing the development of the dairy sector.
CO4. Demonstrate effective problem-solving and management skills in the context of dairy operations.
CO7. Develop research skills relevant to the dairy and food industries.