

Choice Based Credit System Syllabus
(2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: S. Y. B. Voc.(Sem – IV)

Subject: Dairy Technology

Course: Dairy Engineering

Course Code: UBDT- 241

Objectives-

- **To study the different utilities used in dairy plant**
- **To study refrigeration unit, its working, and principle**

Unit-1Refrigeration:Principles of Vapor compression refrigeration cycle, refrigeration components, common refrigerants, properties of good refrigerants, Ice bank Tank (IBT), Bulk milk cooler
12 Periods

Unit-2Basic electrical engineering: Alternating current fundamentals, Polyphase alternating current circuits, star & delta connections. AC Motors, starters & DG set, Fundamentals of Transformer
12 Periods

Unit-3Water Supply and Dairy Effluent System: Tube well, water storage and supply, Water quality water treatments and purification, Waste water treatment, reuse and disposal, Water conservation and rain water harvesting
12 Periods

Unit-4Heat and heat transfer: Heat transfer Principle and Laws, Types of heat exchangers, their installation & working, Microwave heating of milk and milk products. Evaporators and dryers, Humidifiers
12 Periods

Unit-5Equipments and Milk storage: Butter churners – Types, Installation, working & Maintenance, Ice-Cream freezers-Types & working, Ghee Vat, Cheese Vat, Paneer Equipments, Milk storage tanks and milk silos, Packaging equipments of milk/ dairy products and processing units of UHT plant
12 Periods

References:

1. Refrigeration and Air conditioning(1993) Arrora S.C. Domkundwar S.
2. Engineering Thermodynamics (1977) Gupta C.P. , Prakash Rajendra
3. Food Engineering systems (1979) Farrall Arthur W.

Weightage: 1=weak or low relation, 2=moderate or partial relation, 3=strong or direct relation

	Programme Outcomes(POs)								
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9

CO1	2	1		2	2	1		2	2
CO2	2	2	1		2			2	1
CO3	1	2	2	1	2			2	1
CO4	3	3	1	1	2			2	1
CO5	3	2	2		1	1	2	1	3
CO6	3				2			3	3
CO7	3				2		3	3	3

Justification for the mapping

PO1: Disciplinary Knowledge:

All of the COs also contributes to the development of students' disciplinary knowledge in dairy technology. For example, CO4, CO5, require students to master advanced information on characteristics of refrigerants and get depth knowledge of energy flow in an industry. CO1 and CO2 require students to explore engineering section of the processing and able to differentiate between alternative and direct current. CO3 require students to develop a deep understanding of refrigeration cycle. CO6 Study about different utility used in dairy plant. CO7 study of water supply and dairy effluent system

PO2: Critical Thinking and Problem solving

All of the COs also contributes to the development of students' critical thinking and problem-solving skills. For example, CO4 require students to think critically about different characteristics of refrigerant. CO2, CO3 and CO5 require students to use their knowledge on differentiate the currents, knowledge about refrigeration cycle, and solving problem related energy flow in an industry. CO1 require students to think critically about engineering problems in processing section and solving it.

PO3: Social Competence Exhibit thought sand ideas effectively in writing and orally:

CO3, CO5 contribute to the development of students' research-related current and energy flow in industry. For example, CO2 requires students to explore engineering section. CO4 requires students to develop their ability to think critically about characteristics of refrigerants.

PO4: Research-Related Skills:

CO1, CO3, CO4, contribute to the development of students' trans-disciplinary knowledge. For example, CO1 requires students to learn how to apply to explore engineering skills, refrigeration cycle and characteristics of refrigerants.

PO5: Personal and professional competence

CO1, CO2, CO3, CO4, CO5, CO6, CO7 all contribute to the development of students' personal and professional competence. For example, all of the Cos require students to develop the ability to working dependently and as part of a team. They also require students to develop their communication skills and their ability to apply their knowledge to solve real-world problems.

PO6: Effective Citizenship and Ethics:

CO1, CO5 contribute effective citizenship knowledge about engineering processing and energy

flow.

PO7: Environment and sustainability:

CO5 contribute knowledge about energy flow maintenance in an industry and CO7 study of water supply and dairy effluent system

PO8: Self – directed and lifelong learning:

CO1, CO2, CO3,CO4 and CO5, CO6, CO7, contribute lifelong knowledge about the energy flows and primary engineering processes. Study about different utility used in dairy plant and study of water supply and dairy effluent system.

PO9:Trans – disciplinary research competence:

CO1, CO2, CO3, CO4, CO5, CO6, CO7 all contribute to the development of students' ability to engage in self-directed and life-long learning. For example, all of the COs require students to develop their ability to learn new concepts and apply them to new problems. They also require students to develop their ability to think critically about their own learning and to identify areas where they need to improve.

Choice Based Credit System Syllabus
(2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: S. Y. B. Voc.(Sem – IV)

Subject: Dairy Technology

Course: Traditional Indian Dairy Products

Course Code: UBDT- 242

Objectives-

- **To know importance of indigenous milk product and its market demand**
- **To learn the making process of different indigenous milk products**
- **To study the defects to the products and prevention**

Unit 1- Heat desiccated products

12 Periods

- Definition, Composition, And standards of Khoa and Basundi
- Methods of manufacture and factors affecting quality of products
- Khoa based sweets

Unit 2- Paneer and Chhana

12 Periods

Definition, Composition, Standards and Factors affecting quality of Paneer and Chhana, Methods of manufacturing Paneer and Chhana, Chhana based sweets

Unit 3- Concentrated Milks

12 Periods

Definition, standards and nutritive value and principle of evaporation, methods of manufacture and use of sweetened condensed and evaporated milks

Unit 4 Fat Rich Products

Ghee, Butter Definition, Composition and standards, Methods of manufacturing

Unit 5 Judging and Grading of indigenous milk products

12 Period

Procedure for examination, Requirements for high grade products, any indigenous products, defects and their causes and prevention

References:

1. Milk Products of India – ICAR Anantkrishanan C.P. and Srinivasan M.R.
2. Technology of Indian Milk Products- Aneja R.P., Mathur B.N.
3. Indian Dairy Products (1974) Rangappa K.S., Acharya K.T.

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

Course Outcomes	Programme Outcomes(POs)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3			2			2	3	

CO2	1		2	1			2	1	
CO3	1		2	2			2	3	
CO4	2	2	2	3			1	2	
CO5	3							3	
CO6	3			3			2	3	3
CO7	3	3						3	3

Justification for the mapping

PO1: Disciplinary Knowledge:

All of the course outcomes (COs) contribute to the development of students disciplinary knowledge in dairy technology. For example, CO2, CO3, and CO4 require students to understand knowledge about traditional dairy products, its manufacturing process and nutritional value and understand process of heat desiccated, heat and acid coagulated, fat rich products with judging and grading indigenous milk products. CO5 understand the knowledge of indigenous milk products and its market demand. CO6 Understand different making process of indigenous milk product. CO7 Get knowledge about judging and grading of indigenous milk products

PO2: Critical Thinking and Problem solving

All of the COs also contributes to the development of students' critical thinking and problem-solving skills. For example, CO4 require students to think critically about judging and grading of indigenous milk products. CO7 Get knowledge about judging and grading of indigenous milk products

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:

CO2, CO3, and CO4 contribute to the development of students' research-related skills and scientific temper. For example, CO2 requires students to learn importance of traditional Indian dairy products. CO3 requires students to develop their ability to think process of product manufacturing and its nutritional value and CO4 requires students to apply their knowledge of judging and grading of indigenous milk products. CO6 Understand different making process of indigenous milk product

PO4: Research-Related Skills:

CO1, CO2, CO3, and CO4 contribute to the development of students' trans-disciplinary knowledge. For example, CO1 requires students to exposure towards the traditional Indian dairy products. CO2 requires students to know importance of traditional Indian dairy products. CO3 and CO4 require students to apply their knowledge of traditional Indian dairy products in manufacturing and its nutritional value and also helps to judging and grading of milk products. CO6 Understand different making process of indigenous milk product

PO7: Environment and sustainability:

CO1, CO2, CO3, and CO4 all contribute to the development of students knowledge about traditional Indian dairy products. For example, CO1 require to develop exposure of students towards Indian dairy products. CO2 requires students know the importance of traditional Indian dairy products. CO3 and CO4 required to students to acquire information about product manufacturing and its nutritional value and able to understand process, judging and grading of indigenous milk products. CO6Understand different making process of indigenous milk product

PO8: Self – directed and lifelong learning:

CO1, CO2, CO3, and CO4 contribute to the development of students' self directed and lifelong learning. For example, CO1 requires students to exposure towards the traditional Indian dairy products. CO2 requires students to know importance of traditional Indian dairy products. CO3 and CO4 require students to apply their knowledge of traditional Indian dairy products in manufacturing and its nutritional value and also help to judging and grading of milk products. CO5 understand the knowledge of indigenous milk products and its market demand. CO6 Understand different making process of indigenous milk product and CO7 Get knowledge about judging and grading of indigenous milk products

PO9: Trans – disciplinary research competence:

CO6Understand different making process of indigenous milk product and CO7 Get knowledge about judging and grading of indigenous milk products

Choice Based Credit System Syllabus
(2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: S. Y. B. Voc. (Sem – IV)

Subject: Dairy Technology

Course: Food safety, hygiene and Sanitation

Course Code: UBDT- 243

Objectives: To understand the following:

- Food safety, hygiene and sanitation
- Industrial waste utilization
- Design and implementation of food safety management systems such as ISO series, HACCP and its prerequisites such as GMP, GHP etc.

Unit-1: Introduction to Food Safety: Definition, Types of hazards, biological, chemical, physical hazards, Factors affecting Food Safety, Importance of Safe Foods **12 Periods**

Unit-2: Food Safety Management Tools: Basic concept, Prerequisites- GHPs ,GMPs, SOPs etc, HACCP, ISO series, TQM - concept and need for quality, components of TQM, Kaizen. Risk Analysis, Accreditation and Auditing **12 Periods**

Unit-3: Industrial byproducts and waste utilization: Potential & prospects of byproduct & waste utilization from the food Industries in India Byproduct & waste with special reference to milk & milk products **12 Periods**

Unit-4: Hygiene and Sanitation in Food Service Establishments: Introduction, Sources of contamination, Control methods using physical and chemical agents, Waste Disposal, Pest and Rodent Control, Personnel Hygiene, Food Safety Measures **12 Periods**

Unit-5: Recent concerns: New and Emerging Pathogens, Packaging, Product labelling and Nutritional labeling, genetically modified foods\ Transgenics, Organic foods, Newer approaches to food safety, Recent Outbreaks. **12 Periods**

References:

1. Lawley, R., Curtis L. and Davis, J. The Food Safety Hazard Guidebook , RSC publishing, 2004
2. De Vries. Food Safety and Toxicity, CRC, New York, 1997
3. Marriott, Norman G. Principles of Food Sanitation, AVI, New York, 1985
4. Forsythe, S J. Microbiology of Safe Food, Blackwell Science, Oxford, 2000 & Sons; USA, 1987
5. Quality Control for Food Industry – Krammer & Twig

Weightage: 1=weak or low relation, 2=moderate or partial relation, 3=strong or direct relation

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

Justification for the mapping

PO1: Disciplinary Knowledge:

All of the course outcomes (COs) contribute to the development of student's disciplinary knowledge in Dairy Technology. For example, CO1, CO2 require students to master in concept of food safety and its importance along with the hazards of consumption of unsafe food.CO 3 and CO4 require students to apply knowledge of sanitary practices to prevent risks of food borne illnesses. CO5 requires students to apply their knowledge in developing different packaging to ensure food safety. CO6 Get knowledge about packaging methods which can prevent food contamination

CO7Will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO2: Critical Thinking and Problem solving

Some of the outcomes contribute to the development of student's critical thinking and problem-solving skills. For example, CO2 and CO3 require students to think critically about how to apply different processing and preservation techniques to make sure that the food is free from any hazard and is safe for human consumption. CO4 and CO5 require students to use their knowledge in selecting suitable processing technique according to the possible hazard from the product. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:

CO1, CO2 and CO5 contribute to the development of student's Social Competence to exhibit thoughts and ideas effectively in writing and orally. For example, CO1 and CO2 requires students to learn thorough information on food safety and its importance in order to spread ore awareness in the same aspect and eventually contributing to the society.CO5requiresstudentstodeveloptheirabilitytothinkcriticallyabout advanced packaging techniques which can ensure the safety of the food for longer period of time.

PO4: Research-RelatedSkills:

All of the course outcomes (COs) contribute to the development of student's research – related

skills. For example, CO1 requires students to learn importance of food safety and the need of collecting more and more useful information on the same. CO2 requires students to develop an understanding of the connections between the presence of different hazards and their consequences on human health. CO3 and CO4 require students to apply their knowledge of different processing techniques and advancements in the field of food preservation to prevent incidents of food poisoning. CO5 requires students to acquire with effects of different packaging materials on different foods. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO5: Personal and professional competence

CO1, CO2 and CO5 contribute to the development of student's personal and professional competence. For example, all of the mentioned Cos require students to develop their ability to work independently and as part of a team in any organized sector to implement different guidelines. They also require students to develop their communication skills and their ability to apply their knowledge to solve real – world problems. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO6: Effective Citizenship and Ethics:

CO1, CO2 and CO5 contribute to the development of student's Effective Citizenship and Ethics. For example, manufacture of food free from hazards requires student to consider the management systems, guidelines, rules and regulations laid by different govt. and private organizations.

PO7: Environment and sustainability:

All the course outcomes contribute in development of student's Environment and sustainability approach. For example, CO1 and CO2 requires students to understand the intensity of the impact of an unsafe food on the human health. CO3 and CO4 requires student to develop their ability in contributing to the environment and produce a sustainable manufacturing process of a food that ensures food safety of the consumer. CO6 Get knowledge about packaging methods which can prevent food contamination.

PO8: Self – directed and lifelong learning:

All the course outcomes contribute in development of student's self – directed and lifelong learning. For example, CO1 and CO2 require students to get acquainted with common food hazards and their sources to overcome their hazardous implications. CO3 and CO4 requires student to develop an ability to come up with the solutions to assure food safety and quality. CO5 require student to think critically and formulate a technique of protecting the food from its surrounding environment with the help of intelligent packaging. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO9: Trans – disciplinary research competence:

CO2, CO5, contribute to the development of students' ability to engage in self-directed and life-long learning. For example, all of the mentioned COs require students to develop their ability to

learn new concepts and apply them to new problems. They also require students to develop their ability to think critically about their own learning and to identify areas where they need to improve. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

Choice Based Credit System Syllabus
(2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: S. Y. B. Voc. (Sem – IV)

Subject: Dairy Technology

Course: Dairy Engineering (Pr)

Course Code: UBDT- 241-1

Objectives-

- To study the different utilities used in dairy industry
1. Study of home refrigerator 3P
 2. Study and identification of milk storage units 3P
 3. Study of Parts and operations of a cold storage plant and ice bank unit 3P
 4. Study the different parts and learn the operations of the plate chillers and bulk milk coolers 3P
 5. Study of water supply system and water softening plant 3P
 6. Study of different safety measures to be adopted in a dairy plant 3P
 7. Study of various workshop tools 3P
 8. To learn elementary layout, drawings of utilities 3P

Weightage: 1=weak or low relation, 2=moderate or partial relation, 3=strong or direct relation

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

Justification for the mapping

PO1: Disciplinary Knowledge:

All of the course outcomes (COs) contribute to the development of students disciplinary knowledge in dairy technology. For example, CO4, CO5, require students to master advanced information on characteristics of refrigerants and get depth knowledge of energy flow in an industry. CO1 and CO2 require students to explore engineering section of the processing and able to differentiate between alternative and direct current. CO3 require students to develop a

deep understanding of refrigeration cycle. CO6 Study about different utility used in dairy plant. CO7 study of water supply and dairy effluent system

PO2: Critical Thinking and Problem solving

All of the course outcomes (COs) contribute to the development of students critical thinking and problem-solving skills. For example, CO4 require students to think critically about different characteristics of refrigerant. CO2, CO3 and CO5 require students to use their knowledge on differentiate the currents, knowledge about refrigeration cycle, and solving problem related energy flow in an industry. CO1 require students to think critically about engineering problems in processing section and solving it.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:

CO3, CO5 contribute to the development of students' research-related current and energy flow in industry. For example, CO2 requires students to explore engineering section.CO4 requires students to develop their ability to think critically about characteristics of refrigerants.

PO4: Research-Related Skills:

CO1, CO3, CO4, contribute to the development of students' trans-disciplinary knowledge. For example, CO1 requires students to learn how to apply to explore engineering skills, refrigeration cycle and characteristics of refrigerants.

PO5: Personal and professional competence

CO1, CO2, CO3, CO4, CO5, CO6, CO7 all contribute to the development of students' personal and professional competence. For example, all of the COs require students to develop the ability to working dependently and as part of a team. They also require students to develop their communication skills and their ability to apply their knowledge to solve real-world problems.

PO6: Effective Citizenship and Ethics:

CO1, CO5 contribute effective citizenship knowledge about engineering processing and energy flow.

PO7: Environment and sustainability:

CO5 contribute knowledge about energy flow maintenance in an industry and CO7 study of water supply and dairy effluent system

PO8: Self – directed and lifelong learning:

CO1, CO2, CO3, CO4 and CO5, CO6, CO7, contribute lifelong knowledge about the energy flows and primary engineering processes. Study about different utility used in dairy plant and study of water supply and dairy effluent system.

PO9: Trans – disciplinary research competence:

CO1, CO2, CO3, CO4, CO5, CO6, CO7 all contribute to the development of students' ability to engage in self-directed and life-long learning. For example, all of the COs requires students to develop their ability to learn new concepts and apply them to new problems. They also require students to develop their ability to think critically about their own learning and to identify areas where they need to improve.

Choice Based Credit System Syllabus
(2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: S. Y. B. Voc. (Sem – IV)

Subject: Dairy Technology

Course: Traditional Indian Dairy Products (Pr)

Course Code: UBDT- 241-2

Objectives-

- To learn the making process of different indigenous milk products

1. Preparation of Khoa	1P
2. Preparation of Gulabjamun	2P
3. Preparation of Rassgulla	2P
4. Preparation of Pedha	3P
5. Preparation of Barfi	3P
6. Preparation of Kalakand	2P
7. Preparation of Chhana	3P
8. Preparation of Chakka	2P
9. Preparation of Rasmalai	3P
10. Preparation of Paneer	3P

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

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

Justification for the mapping

PO1: Disciplinary Knowledge

All of the course outcomes (COs) contribute to the development of students disciplinary knowledge in dairy technology. For example, CO2, CO3, and CO4 require students to understand knowledge about

traditional dairy products, its manufacturing process and nutritional value and understand process of heat desiccated, heat and acid coagulated, fat rich products with judging and grading indigenous milk products. CO5 understand the knowledge of indigenous milk products and its market demand. CO6 Understand different making process of indigenous milk product. CO7 Get knowledge about judging and grading of indigenous milk products

PO2: Critical Thinking and Problem solving

The entire COs also contributes to the development of students' critical thinking and problem-solving skills. For example, CO4 require students to think critically about judging and grading of indigenous milk products. CO7 Get knowledge about judging and grading of indigenous milk products

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:

CO2, CO3, and CO4 contribute to the development of students' research-related skills and scientific temper. For example, CO2 requires students to learn importance of traditional Indian dairy products. CO3 requires students to develop their ability to think process of product manufacturing and its nutritional value and CO4 requires students to apply their knowledge of judging and grading of indigenous milk products. CO6 Understand different making process of indigenous milk product

PO4: Research-Related Skills:

CO1, CO2, CO3, and CO4 contribute to the development of students' trans-disciplinary knowledge. For example, CO1 requires students to exposure towards the traditional Indian dairy products. CO2 requires students to know importance of traditional Indian dairy products. CO3 and CO4 require students to apply their knowledge of traditional Indian dairy products in manufacturing and its nutritional value and also helps to judging and grading of milk products. CO6 Understand different making process of indigenous milk product

PO7: Environment and sustainability:

CO1, CO2, CO3, and CO4 all contribute to the development of students knowledge about traditional Indian dairy products. For example, CO1 require to develop exposure of students towards Indian dairy products. CO2 requires students know the importance of traditional Indian dairy products. CO3 and CO4 required to students to acquire information about product manufacturing and its nutritional value and able to understand process, judging and grading of indigenous milk products. CO6 Understand different making process of indigenous milk product

PO8: Self – directed and lifelong learning:

CO1, CO2, CO3, and CO4 contribute to the development of students' self directed and lifelong learning. For example, CO1 requires students to exposure towards the traditional Indian dairy products. CO2 requires students to know importance of traditional Indian dairy products. CO3 and CO4 require students to apply their knowledge of traditional Indian dairy products in manufacturing and its nutritional value and also help to judging and grading of milk products. CO5 understand the knowledge of indigenous milk products and its market demand. CO6 Understand different making process of indigenous milk product and CO7 Get knowledge about judging and grading of indigenous milk products

PO9:Trans – disciplinary research competence:

CO6 Understand different making process of indigenous milk product and CO7 Get knowledge about judging and grading of indigenous milk products

Choice Based Credit System Syllabus
(2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: S. Y. B. Voc.(Sem – IV)

Subject: Dairy Technology

Course: Food safety, hygiene and Sanitation (Pr)

Course Code: UBDT- 241-3

Objectives-

- To study different schedules and charts
 - To study the properties and use of different detergents, sanitizers and their required strength.
1. Preparation of inspection schedule and inspection charts. 4P
 2. Study of CIP system 4P
 3. Preparation of detergent & sanitizer solutions of desired strength. 4P
 4. Test for sanitization of dairy equipment (Swab method) 4P
 5. Contamination Control methods using physical and chemical agents 4P
 6. To study Personnel Hygiene habits 4P

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

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

Justification for the mapping

PO1: Disciplinary Knowledge:

All of the course outcomes (COs) contribute to the development of student’s disciplinary knowledge in Dairy Technology. For example, CO1, CO2 require students to master in concept of food safety and its importance along with the hazards of consumption of unsafe food.CO 3 and CO4 require students to apply knowledge of sanitary practices to prevent risks of food borne illnesses. CO5 requires students to

apply their knowledge in developing different packaging to ensure food safety. CO6 Get knowledge about packaging methods which can prevent food contamination

CO7 Will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO2: Critical Thinking and Problemsolving

Some of the outcomes contribute to the development of student's critical thinking and problem-solving skills. For example, CO2 and CO3 require students to think critically about how to apply different processing and preservation techniques to make sure that the food is free from any hazard and is safe for human consumption. CO4 and CO5 require students to use their knowledge in selecting suitable processing technique according to the possible hazard from the product. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO3: Social Competence Exhibit thoughts and ideas effectively in writing and orally:

CO1, CO2 and CO5 contribute to the development of student's Social Competence to exhibit thoughts and ideas effectively in writing and orally. For example, CO1 and CO2 requires students to learn thorough information on food safety and its importance in order to spread ore awareness in the same aspect and eventually contributing to the society. CO5 requires students to develop their ability to think critically about advanced packaging techniques which can ensure the safety of the food for longer period of time.

PO4: Research-Related Skills:

All of the course outcomes (COs) contribute to the development of student's research – related skills. For example, CO1 requires students to learn importance of food safety and the need of collecting more and more useful information on the same. CO2 requires students to develop an understanding of the connections between the presence of different hazards and their consequences on human health. CO3 and CO4 require students to apply their knowledge of different processing techniques and advancements in the field of food preservation to prevent incidents of food poisoning. CO5 requires students to acquire with effects of different packaging materials on different foods. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO5: Personal and professional competence

CO1, CO2 and CO5 contribute to the development of student's personal and professional competence. For example, all of the mentioned Cos require students to develop their ability to work independently

and as part of a team in any organized sector to implement different guidelines. They also require students to develop their communication skills and their ability to apply their knowledge to solve real – world problems. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO6:Effective Citizenship and Ethics:

CO1, CO2 and CO5 contribute to the development of student’s Effective Citizenship and Ethics. For example, manufacture of food free from hazards requires student to consider the management systems, guidelines, rules and regulations laid by different govt. and private organizations.

PO7:Environment and sustainability:

All the course outcomes contribute in development of student’s Environment and sustainability approach. For example, CO1 and CO2 requires students to understand the intensity of the impact of an unsafe food on the human health. CO3 and CO4 requires student to develop their ability in contributing to the environment and produce a sustainable manufacturing process of a food that ensures food safety of the consumer. CO6 Get knowledge about packaging methods which can prevent food contamination.

PO8:Self – directed and lifelong learning:

All the course outcomes contribute in development of student’s self – directed and lifelong learning. For example, CO1 and CO2 require students to get acquaint with common food hazards and their sources to overcome their hazardous implications. CO3 and CO4 requires student to develop an ability to come up with the solutions to assure food safety and quality. CO5 require student to think critically and formulate a technique of protecting the food from its surrounding environment with the help of intelligent packaging. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

PO9:Trans – disciplinary research competence:

CO2, CO5, contribute to the development of students' ability to engage in self-directed and life-long learning. For example, all of the mentioned COs require students to develop their ability to learn new concepts and apply them to new problems. They also require students to develop their ability to think critically about their own learning and to identify areas where they need to improve. CO6 Get knowledge about packaging methods which can prevent food contamination. CO7 will know about the properties and uses of different detergent, sanitizers and cleaning agents.

