Anekant Education Society's

Tuljaram Chaturchand College, Baramati.

(Empowered Autonomous)

Three Year B. Voc. Degree Programme in Dairy Technology

(Faculty of Vocational Courses)

CBCS Syllabus

F. Y. B. Voc. Dairy Technology Semester -I

For Department of

Dairy Technology

Tuljaram Chaturchand College, Baramati

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

To be implemented from Academic Year 2025-2026

Title of the Programme: F. Y. B. Voc.(Dairy Technology)

Preamble

AES's Tuljaram Chaturchand College has made the decision to change the syllabus of across various faculties from June, 2023 by incorporating the guidelines and provisions outlined in the National Education Policy (NEP), 2020. As per recommendation of steering committee meeting held on 22nd and 23rd April 2025, they have suggested separate guideline for Vocational Program. This syllabus is according to the same guideline. The NEP envisions making education more holistic and effective and to lay emphasis on the integration of general (academic) education, vocational education and experiential learning. The NEP introduces holistic and multi disciplinary education that would help to develop intellectual, scientific, social, physical, emotional, ethical and moral capacities of the students. The NEP 2020 envisages flexible curricular structures and learning based outcome approach for the development of the students. By establishing a nationally accepted and internationally comparable credit structure and courses framework, the NEP 2020 aims to promote educational excellence, facilitate seamless academic mobility, and enhance the global competitiveness of Indian students. It fosters a system where educational achievements can be recognized and valued not only within the country but also in the international arena, expanding opportunities and opening doors for students to pursue their aspirations on a global scale.

In response to the rapid advancements in science and technology and the evolving approaches in various domains of Dairy sector and related subjects, the Board of Studies in Dairy Technology at Tuljaram Chaturchand College, Baramati - Pune, has developed the curriculum for the first semester of F. Y. B. Voc. Dairy Technology, which goes beyond traditional academic boundaries. The syllabus is aligned with the NEP 2020 guidelines to ensure that students receive an education that prepares them for the challenges and opportunities of the 21stcentury. This syllabus has been designed under the framework of the Choice Based Credit System (CBCS), taking into consideration the guidelines set forth by the National Education Policy (NEP) 2020, LOCF (UGC), NCrF, NHEQF, Prof. R. D. Kulkarni's Report, Government of Maharashtra's General Resolution dated 20thApril and 16th May 2023, and the Circular issued by SPPU, Pune on 31st May2023.

The department of Dairy technology aims at imparting quality education in the realm of procurement, processing and packaging of milk and milk products with an objective to enhance and expand the knowledge and skill set of target students so that they can contribute in the betterment of society at large. The department of Dairy Technology was established with the objective of producing highly proficient technocrats who can meet the standards of the corporate. The department purports to have dexterous mentors adept at molding the student talent pool. A team of well qualified faculty navigates issuing priceless guidance and tapping the potential of students.

It is estimated that a huge number of Dairy Technology professionals will be required in India five years down the line in keeping with the global trend. Indian professionals are respected across the world for their technology – related skills. Our focus in this department is not only on completing the curriculum to pass the examinations but we also try to keep up with the developments in the technology and expose the students to the latest to ensure that they are able to cope up with the fast changing industrial scenario.

The department is in purpose – built accommodation and is equipped with teaching and office space as well as well equipped laboratories for practical - based teaching. All faculties of the department are members of various professional societies and technical bodies like AFST (I), etc. the department has signed MoU's with various organizations for student exchange and projects.

Overall, revising the Dairy Technology syllabus in accordance with the NEP 2020 ensures that students receive an education that is relevant, comprehensive, and prepares them to navigate the dynamic and interconnected world of today. It equips them with the knowledge, skills, and competencies needed to contribute meaningfully to society and pursue their academic and professional goals in a rapidly changing global landscape.

Programme Specific Outcomes (PSOs)

PSO1: Technical Competence
Students will acquire specialized technical knowledge and practical skills in dairy processing, milk product manufacturing, quality assurance, and plant operations, enabling them to work efficiently in dairy and allied industries.

PO2 Problem Solving Skills:
Students will develop analytical and critical thinking skills to identify, assess, and resolve challenges in dairy operations using a blend of theoretical understanding and hands-on experience.

PO3 Employability Skills:
Students will demonstrate essential workplace competencies including effective communication, teamwork, leadership, adaptability, time management, and professional ethics for improved employability in the dairy sector.

PO4 Industry Relevance and entrepreneurial abilities:
Students will be equipped with industry-relevant skills and entrepreneurial capabilities, empowering them to start and manage dairy-based businesses, cooperative ventures, or self-employment projects.

PO5 Ethical and Social Responsibility:
Students will recognize and apply ethical principles and social responsibilities in dairy practices, ensuring consumer safety, fair trade, and compliance with industry regulations.

PO6 Environmental Awareness: Students will understand and apply eco-friendly and sustainable practices in dairy production, focusing on climate change mitigation, pollution control, and effective waste and water management.

PO7 Research and Innovations:
Students will gain exposure to research methodologies and innovative practices, enabling them to contribute to process improvements, product development, and scientific advancements in dairy technology.

PO8 Global Perspective:
Students will understand international trends, standards, and market demands in the dairy industry, enabling them to adapt to global practices and opportunities.

PO9 Multidisciplinary studies: Students will integrate knowledge from microbiology, food science, engineering, management, and ICT to build a comprehensive skill set relevant to diverse roles in the dairy and food sector.

PO10 Community Engagement: Students will engage in socially responsible activities and extension services to promote rural development, nutrition, public health, and sustainable livelihoods through dairy-based initiatives.

Anekant Education Society's

Tuljaram Chaturchand College

of Arts, Science and Commerce Baramati, Dist-Pune

(Empowered Autonomous)

Board of Studies in Dairy Technology

(Academic Year 2025-26 to 2027-28)

Sr.No.	Name of Member	Designation
1.	**Mr. Khan Wajid A.** Assistant Professor Department of Dairy Technology, T. C. College, Baramati.	**Chairperson**
2.	**Mrs. Ganbote Shruti S.** Assistant Professor, Department of Dairy Technology, T. C. College, Baramati	Member
3.	**Ms. Patil Pallavi R.** Assistant Professor, Department of Dairy Technology, T. C. College, Baramati	Member
4.	**Mrs. Sujata Patil**	Vice-Chancellor Nominee Subject Expert from SPPU, Pune
5.	**Dr. Khojare Ajit S.**	Subject Expert from Outside the Parent University
6.	**Dr. Pathan Fayaz L.**	Subject Expert from Outside the Parent University
7.	**Mr. Bhapkar Sandeep**	Representative from industry/corporate sector/allied areas
8.	**Mr. Chavan Shubham**	Member of the College Alumni
9.	**Mr. Shrey Chavan**	UG Student

Credit Distribution Structure for F. Y. B. Voc. – 2023 – 2024 (Dairy Technology)

Level	Semester	Major		Minor	OE	VSC,SEC, (VSEC)	AEC,VEC,IKS	OJT, FP,CEP, CC,RP	Cum. Cr/Sem	Degree/Cum.Cr.
		Mandatory	Electives							
4.5	I	DRT-101-MJM: Dairy Technology (2credits)	--	--	DRT -107-OE: Introduction to Milk Processing (2credits)	DRT -108-SEC: Soft skill Development (2credits)	ENG-101-AEC Functional English-I(2credit)	--	22	UG Certificate 44credits
		DRT -102-MJM: Practical's of Dairy Technology (2credits)					DRT -105-VEC: Environmental Education (2credits)			
		DRT -103-MJM: Dairy Chemistry - I (2credits)								
		DRT -104-MJM: Chemical analysis of milk - I (2credits)					DRT -106-IKS: Generic (2credits)			
		DRT -105-MJM: Dairy Microbiology - I (2credits)								
		DRT -106-MJM: Microbial Analysis of								

		Milk –I (2credits)								
	II	DRT -151-MJM:Market Milk (2 credits)	--		DRT -157-OE: Practical's of Dairy Technology - (2credits)	DRT -158-SEC Computer skills (2credits)	ENG-151-AEC Functional English-II(2credit)	CC (2credit)	22	
		DRT -152-MJM: Practicals of Market milk (2 credits)								
		DRT -153-MJM: Dairy Chemistry (2 credits)					DRT -155-VEC: Digital and Technological Solutions (2credits)			
		DRT -154-MJM: Practicals of Dairy Chemistry (2 credits)								
		DRT -155-MJM: Dairy Microbiology (2 credits)								
		DRT -156-MJM: Practical Microbial analysis of milk (2 credits)								
	Cum Cr.	**24**	--	--	4	4	10	2	44	

Course Structure for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Sem	Course Type	Course Code	Course Name	Theory /Practical	Credits
I	DSC – I (General)	DRT - 101 - GEN	Dairy Technology	Theory	02
		DRT - 102 - GEN	Practical's of Dairy Technology	Practical	02
	DSC – II (General)	DRT - 103 - GEN	Dairy Chemistry - I	Theory	02
		DRT - 104 - GEN	Practical's of Dairy Chemistry - I	Practical	02
	DSC – III (General)	DRT - 105 - GEN	Dairy Microbiology - I	Theory	02
		DRT - 106 - GEN	Practical's of Dairy Microbiology - I	Practical	02
	Open Elective (OE)	DRT - 107 - OE	Introduction to Milk Processing	Theory	02
	Skill Enhancement Course (SEC)	DRT - 108 - SEC	Soft skill development	Practical	02
	Indian Knowledge System (IKS)	GEN - 106 - IKS	General	Theory	02
	Ability Enhancement Course (AEC)	ENG - 101 - AEC	Functional English-I	Theory	02
	Value Education Course (VEC)	ENV - 105 - VEC	Environmental Education	Theory	02
				Total Credits Semester- I	**22**
II	DSC – I (General)	DRT - 151 - GEN	Market Milk	Theory	02
		DRT - 152 - GEN	Practical's of Market Milk	Practical	02
	DSC – II (General)	DRT - 153 - GEN	Dairy Chemistry - II	Theory	02
		DRT - 154 - GEN	Practical's of Dairy Chemistry - II	Practical	02
	DSC – III (General)	DRT - 155 - GEN	Dairy Microbiology - II	Theory	02
		DRT - 156 - GEN	Practical's of Dairy Microbiology - II	Practical	02
	Open Elective (OE)	DRT - 157 - OE	Practical's of Dairy Technology	Practical	02
	Skill Enhancement Course(SEC)	DRT - 158 - SEC	Computer Skills	Practical	02
	Ability Enhancement Course(AEC)	ENG - 151 - AEC	Functional English-II	Theory	02
	Value Education Course(VEC)	COS - 155 - VEC	Digital & technological Solutions	Theory	02
	Co-curricular Course(CC)	YOG/PEC/CUL/NSS/NCC - 156 - CC	To be selected from the Basket	-	02
				Total Credits Semester II	22
				Cumulative Credits Semester I and II	**44**

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : B. Voc. Dairy Technology

Programme Code : DRT

Class : F. Y. B. Voc.

Semester : I

Course Type : Major Mandatory

Course Code : DRT-101-MJM

Course Title : Dairy Technology

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

- To know importance of dairy Technology.
- To study about milk and its chemical composition and nutritive value.
- To know the government policies for dairy industry in India.
- To understand scope of dairy technology.
- To study about Entrepreneurship and Dairy Management in India.
- To acquaint with the knowledge of dairy development in India.
- To study about SWOT Analysis.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand the importance of Dairy Technology.

CO2. Explain milk and its composition.

CO3. Understand different government policies for dairy in India.

CO4. Understand scope of dairy technology.

CO5. Understand the composition and nutritive value of milk.

CO6. Understand about Entrepreneurship and Dairy Management in India.

CO7. Understand the Dairy Development in India.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3				2		2	2		3
CO2					3	1			3	
CO3		2	3	2		3	3			
CO4		3			3		3			

CO5	1		2		3	2	1		3	2
CO6		3	3	2	2	2		3	1	
CO7			3	3						

Justification for the mapping

PO2 Problem Solving Skills

CO6. Understand about Entrepreneurship and Dairy Management in India.

PO3 Employability Skill

CO3. Understand different government policies for dairy in India.
CO6. Understand about Entrepreneurship and Dairy Management in India.
CO7. Understand the Dairy Development in India.

PO4 Industry Relevance and entrepreneurial abilities

CO6. Understand about Entrepreneurship and Dairy Management in India.
CO7. Understand the Dairy Development in India.

PO5 Ethical and Social Responsibility

CO1. Understand the importance of Dairy Technology.
CO2. Explain milk and its composition.
CO4. Understand scope of dairy technology.
CO5. Understand the composition and nutritive value of milk.

PO6 Environmental Awareness

CO3. Understand different government policies for dairy in India.

PO7 Research and Innovations

CO4. Understand scope of dairy technology.
CO6. Understand about Entrepreneurship and Dairy Management in India.

PO8 Global Perspective

CO6. Understand about Entrepreneurship and Dairy Management in India.
CO7. Understand the Dairy Development in India.

PO9 Multidisciplinary studies

CO2. Explain milk and its composition.
CO5. Understand the composition and nutritive value of milk.

PO10 Community Engagement

CO1. Understand the importance of Dairy Technology.
CO5. Understand the composition and nutritive value of milk.

Topic sand Learning Points

Unit-1: Introduction to Dairy Science and Milk Composition:

- Definition and importance of Dairy Technology.
- Milk: definition, composition and nutritional value.
- Factors affecting composition of milk. **08 P**

Unit-2: Dairy development in India:

Definition, common terms in dairy technology, history and scope of dairy technology, Dairy development in India, National Dairy Development Board (NDDB), White Revolution (Operation Flood), advantages of dairying. **07 P**

Unit-3: Government Policies and incentives:

Schemes for Development of Dairying, Assistance to Cooperatives, Intensive Dairy Development Programme (IDDP), Incentive schemes for Farmers, youth and Entrepreneurs, Other Schemes for dairying **07 P**

Unit-4:Dairy Management and Entrepreneurship: Definition of entrepreneurship; entrepreneurial & managerial characteristics; managing an enterprise; importance of planning, monitoring, evaluation and follow up; entrepreneurship development programs; SWOT analysis. **08P**

References:

- Livestock and Poultry Production, (1982) Singh Harbans and Moore Earl N.
- Livestock Production Management, (1999)Sastry N.S.R Kalyani Publishers

ICAR , Handbook of animal Husbandary (200)

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : B. Voc. Dairy Technology

Programme Code : DRT

Class : F .Y. B. Voc.

Semester : I

Course Type : Major Mandatory

Course Code : DRT -102-MJM

Course Title : Practical's of Dairy Technology

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

- To understand the milk and its composition
- To know the milk components and their properties.
- To study physical examination of milk.
- To study the enzymes present in milk
- To understand the structure of Milk fat globule
- To study the nutritional benefits of milk
- To understand demonstration different isolation of pure culture techniques.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand the basic laboratory practices.

CO2. Identify and classify Indian and exotic breeds.

CO3. To study about physical examination of milk.

CO4. To study about preparation of business plan for small scale dairy unit.

CO5. Understand the process of record keeping on dairy farms.

CO6. Understand the structure, design & layout for small scale dairy plant.

CO7. Perform isolation techniques of pure culture.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1					2			2		
CO2									3	
CO3			3							
CO4							3			
CO5	1			3	3		2		3	2
CO6		3		2		2	2	3	1	
CO7	3					3	3			

Justification for the mapping

PSO1: Technical Competence
CO7. Perform isolation techniques of pure culture.

PO4 Industry Relevance and entrepreneurial abilities
CO5. Understand the role of the fortification with vitamin D

PO5 Ethical and Social Responsibility

CO1. Understand the chemical make-up of milk.
CO5. Understand the role of the fortification with vitamin D

PO6 Environmental Awareness
CO6. Understand the structure of microorganisms.
CO7. Perform isolation techniques of pure culture.

PO7 Research and Innovations
CO4. Explain the stages and factors involved in Maillard reaction
CO5. Understand the role of the fortification with vitamin D
CO6. Understand the structure of microorganisms.
CO7. Perform isolation techniques of pure culture.

PO8 Global Perspective
CO5. Understand the role of the fortification with vitamin D

PO9 Multidisciplinary studies

CO1. Understand the chemical make-up of milk.
CO2. Explain the features of fat globule membrane
CO3. Identify and classify major milk components
CO6. Understand the structure of microorganisms.
CO7. Perform isolation techniques of pure culture.

PO10 Community Engagement
CO5. Understand the role of the fortification with vitamin D

Topics and Learning Points

1. Introduction to basic laboratory practices.
2. Physical examination of milk
3. Identification of Breeds
4. Analysis of government policies & schemes related to dairy sector.
   (Rashtriya Gokul mission and DEDS)
5. Preparation of milk procurement & distribution process (Flowchart) from farmer to consumer – cooperative to private modules.
6. Record keeping in farm management.
7. Preparation of business plan for a small dairy unit
   (Capital investment, infrastructure, feed)
8. Design & layout for small scale dairy plant.
9. Visit to dairy cooperative society.
   (To understand structure, functions & rural development and to prepare a visit report.)
10. Case study of a dairy Industry.
    (History, structure, functions & success factor)

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : B. Voc. Dairy Technology

Programme Code : DRT

Class : F .Y. B. Voc.

Semester : I

Course Type : Major Mandatory

Course Code : DRT -103-MJM

Course Title : Dairy Chemistry

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

- To understand the milk and its composition
- To know the milk components and their properties.
- To study the factors affecting milk coagulation.
- To study the enzymes present in milk
- To understand the structure of Milk fat globule
- To study the nutritional benefits of milk
- They will be able to understand correlation of different components of milk

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand the chemical make-up of milk.

CO2. Explain the features of fat globule membrane

CO3. Identify and classify major milk components

CO4. Explain the stages and factors involved in Maillard reaction

CO5. Understand the role of the fortification with vitamin D

CO6. Understand the nutritional benefits of milk

CO7. Understand correlation of different components of milk

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3				2		2	2		
CO2		3				1				
CO3				2						
CO4		3								
CO5	1	1	2		3		1	3		
CO6				1	2	2		3	1	2
CO7		2								

Justification for the mapping

PSO1: Technical Competence:
CO1: Students will acquire comprehensive knowledge of chemicals used in milk analysis.
CO4: Students will gain exposure to the instruments employed in milk analysis.
CO7: Students will be able to prepare chemicals of different normality used for milk analysis.

PO2 Problem Solving Skills
CO2: Students will critically analyze standard values of quality parameters in milk.
CO3: Students will develop the ability to examine and evaluate the quality of milk.
CO6: Students will demonstrate critical thinking skills by performing different platform tests for milk.

PO4 Industry Relevance and entrepreneurial abilities:
CO3: Students will develop competence in examining the quality of milk.
CO4: Exposure to instruments will contribute to personal and professional competence.

PO5 Ethical and Social Responsibility
CO5**.**Understand the role of the fortification with vitamin D

PO7 Research and Innovations:
CO1: Students will engage in research by acquiring knowledge of chemicals used in milk analysis.
CO2: Students will conduct research by understanding standard values of quality parameters in milk.

PO8 Global Perspective
CO5**.**Understand the role of the fortification with vitamin D

PO9 Multidisciplinary studies:
CO5: Students will understand the functions of all the chemicals used for milk analysis.
CO6: Performing different platform tests for milk will encourage self-directed learning.

PO10: Community Engagement:
CO6. Understand the nutritional benefits of milk

Topics and Learning Points

Unit-1: Introduction to dairy chemistry:
Definition and importance of Dairy chemistry.
Structure of water, phase diagram of water, water activity. **6P**

Unit-2: Chemistry of milk:
Definition and structure of milk, composition of Milk, Physico-chemical of Milk, Nutritive value of Milk, Colostrum, Coagulation of Milk with acid, heat enzymes and alcohol. **7P**

Unit-3: Carbohydrates:
Definition of Carbohydrates and its classification.
Milk carbohydrates their status and importance.
Physical and chemical properties of lactose, processing related degradation of lactose.
7P

Unit-4: Proteins:
Nomenclature and classification of milk proteins.
Casein, α-Lactalbumin and β lactoglobulin, Immunoglobulin and other minor milk proteins and non-proteins nitrogen constituents of milk.
Hydrolysis and denaturation of milk proteins under different physical and chemical environments.
Milk enzymes with special reference to lipases, Xanthine, Oxidase, phosphates, proteases and lactoperoxidase.
10P

References:

- Principles of dairy chemistry (1959) Jenness R and Patton S. John Wiley's, USA
- Fundamentals of Dairy chemistry, (1979) Webb B.H.
- Test book of Dairy Chemistry (1999) ICAR

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : B. Voc. Dairy Technology

Programme Code : DRT

Class : F .Y. B. Voc.

Semester : I

Course Type : Major Mandatory

Course Code : DRT-104-MJM

Course Title : Chemical Analysis of Milk

No. of Credits : 02

No. of Teaching Hours : 60

Course Objectives:

- Students will get vast knowledge of chemicals used for milk analysis.
- They will understand standard values of quality parameters.
- They will be able to examine the quality of the milk.
- They will get exposure to the instruments of analysis.
- They will understand the functions of all the chemicals used for the analysis.
- They will able to perform different platform test for milk.
- They will be able to prepare chemicals of different normality used for milk analysis.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Knowledge of chemicals used for milk analysis.

CO2. Explain standard values of quality parameters.

CO3. Examine the quality of the milk

CO4. Explain the common milk adulterants

CO5. Explain various instruments of analysis

CO6. Understand different platform test for milk in dairy industry.

CO7. Understand the functions of all the chemicals used for the analysis.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3			3						

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

Justification for the mapping

PO1: Technical Competence:
CO1: Students will acquire comprehensive knowledge of chemicals used in milk analysis.
CO4: Students will gain exposure to the instruments employed in milk analysis.
CO7: Students will be able to prepare chemicals of different normality used for milk analysis.

PO2: Problem Solving Skills :
CO2: Students will critically analyze standard values of quality parameters in milk.
CO3: Students will develop the ability to examine and evaluate the quality of milk.
CO6: Students will demonstrate critical thinking skills by performing different platform tests for milk.

PO4 Industry Relevance and entrepreneurial abilities::
CO3: Students will develop competence in examining the quality of milk.
CO4: Exposure to instruments will contribute to personal and professional competence.

PO7 Research and Innovations:
CO1: Students will engage in research by acquiring knowledge of chemicals used in milk analysis.
CO2: Students will conduct research by understanding standard values of quality parameters in milk.

PO9 Multidisciplinary studies:
CO5: Students will understand the functions of all the chemicals used for milk analysis.
CO6: Performing different platform tests for milk will encourage self-directed learning.

Topics and Learning Points	
1. Study of Glassware's used in laboratory	**6P**
2. Physical examination of Milk	**6P**
3. Sampling of Milk.	**6P**
4. Determination of MBRT test	**6P**
5. Determination of Clot On Boiling (COB) test	**6P**
6. Determination of Alcohol Test	**6P**
7. Preparation of Standard 0.1N Sodium Hydroxide Solution	**6P**
8. Determination of pH of Milk	**6P**
9. Determination of Titrable Acidity of milk	**6P**
10. Determination of urea in milk	**6P**

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : B. Voc. Dairy Technology

Programme Code : DRT

Class : F .Y. B. Voc.

Semester : I

Course Type : Major Mandatory

Course Code : DRT-105-MJM

Course Title : Dairy Microbiology

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

- Students will learn about microbial make-up of milk.
- They will understand the microorganisms of commercial importance.
- They will get acquainted with the different methods of microbial analysis.
- They will know the overall effect of microbial action on milk.
- They will know the types of organisms, beneficial & harmful microorganisms .
- They will learn about different staining methods which is used in microbiology.
- They will be able to demonstrate different isolation of pure culture techniques.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Students will learn about microbial make-up of milk.

CO2. They will understand the microorganisms of commercial importance.

CO3. They will get acquainted with the different methods of microbial analysis.

CO4. They will know the overall effect of microbial action on milk.

CO5. They will know the types of organisms, beneficial & harmful microorganisms .

CO6. They will learn about different staining methods which is used in microbiology.

CO7. They will be able to demonstrate different isolation of pure culture techniques.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1		1		1		2			
CO2		1		3		2		3	2	1

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

Justification for the mapping

PSO1: Technical Competence

All of the course outcomes (COs) contribute to the development of students' disciplinary knowledge in Dairy Technology. For example, CO1, and CO2 require students to get knowledge about Dairy Microbiology. CO3 require students to apply suitable techniques for analysis of milk.

PO2 Problem Solving Skills

All of the COs also contributes to the development of students' critical thinking and problem-solving skills. For example, CO3, and CO4 require students to think critically about different techniques for microbial analysis, overall effect of microbial action on milk. CO5 require students to use their knowledge and think critically on types of organisms, beneficial and harmful microorganisms in Milk.

PO3 Employability Skills
CO2, CO3, CO4, CO5, CO6 and CO7 all contribute to the development of students' professional competence. For example, all of the COs require students to develop their ability to work independently and as part of a team.

PO5 Ethical and Social Responsibility:
CO2, CO3, CO5 contribute towards the development of ethics in Microbiology of milk and milk products.

PO6 Environmental Awareness
CO5 will contribute to the types of organisms, beneficial & harmful microorganisms .

PO7 Research and Innovations :
CO2, CO3, CO4, and CO5 contribute to the development of students' research related skills. For example, CO5 requires students to learn how to perform different methods of microbial analysis. CO7 requires student to learn to demonstrate different isolation of pure culture techniques.

PO9 Multidisciplinary studies:

All of the course outcomes (COs) contribute to the development of students' life long learning in Dairy Technology. For example, CO1, CO2, CO3, CO4 and CO5 require students to get lifelong knowledge about microbiology of milk and milk products. CO6 and CO7 require students to get knowledge about methods of staining and methods of isolation of pure starter culture.

PO10 Community Engagement:

CO2.They will understand the microorganisms of commercial importance.

Topics and Learning Points

Unit 1: History & scope of Microbiology: Introduction to microbiology & Microorganisms, Historical Contribution of various scientists, scope of microbiology in food, Types of cell – Prokaryotic & Eukaryotic cell,

8 Periods

Unit 2: Microorganisms: Introduction to various types of micro-organisms, Introduction to applied branches in microbiology, Structure of bacteria.

7 Periods

Unit-3: Microscopy: definition of microscope, general principles of microscopy, application and importance of microscope, types of microscope.

7 Periods

Unit 4: Growth of microorganisms in food: Introduction , definition, growth curve, types of microorganism in raw milk, sources of contamination in raw milk, factors affecting growth of microorganisms in food. **8 Periods**

References:

- Food Microbiology (2013) William C Frazier
- Dairy Microbiology (2005) Richard K. Robinsons
- Dairy Microbiology : A Practical approach PhotisPapademas (2014)

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : B. Voc. Dairy Technology

Programme Code : DRT

Class : F .Y. B. Voc.

Semester : I

Course Type : Major Mandatory

Course Code : DRT-106-MJM

Course Title : Microbial analysis of milk

No. of Credits : 02

No. of Teaching Hours : 60

Course Objectives:

- Students will learn about microbial make-up of milk.
- They will understand the microorganisms of commercial importance.
- They will get acquainted with the different methods of microbial analysis.
- They will know the overall effect of microbial action on milk.
- They will know the types of organisms, beneficial & harmful microorganisms .
- They will learn about different staining methods which is used in microbiology.
- They will be able to demonstrate different isolation of pure culture techniques.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Students will learn about microbiology in milk

CO2. They will understand the microorganisms of commercial importance & its use for industrial production.

CO3. They will get acquainted with the different methods of microbial analysis & microbial sampling

CO4. They will know the overall effect of microbial action on milk as well as effect on environmental factors on microbial growth.

CO5. They will know the types of organisms, beneficial & harmful microorganisms .

CO6. They will learn about different staining methods which is used in microbiology.

CO7. They will be able to demonstrate different isolation of pure culture techniques.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1		1		1		2			
CO2		1		3		2		3	2	2
CO3	2		2		3		2		2	
CO4	1	2	2	3		2				
CO5		2	2	3		2	2		2	
CO6	2				3			3	1	
CO7	2	1			3		1	3		

Justification for the mapping

PSO1: Technical Competence:

All of the course outcomes (COs) contribute to the development of students' disciplinary knowledge in Dairy Technology. For example, CO1, and CO2 require students to get knowledge about Dairy Microbiology. CO3 require students to apply suitable techniques for analysis of milk.

PO2 Problem Solving Skills

All of the COs also contributes to the development of students' critical thinking and problem-solving skills. For example, CO3, and CO4 require students to think critically about different techniques for microbial analysis, overall effect of microbial action on milk. CO5 require students to use their knowledge and think critically on types of organisms, beneficial and harmful microorganisms in Milk.

PO6 Environmental Awareness:
CO3 and CO4 contribute to the development of students' research-related skills and scientific temper towards microbial analysis and overall effect of microbial action on milk. For example, CO3 requires students to learn different methods of microbial analysis. CO4 require students to develop their ability to think critically about effect of microorganisms on milk.

PO7 Research and Innovations :

CO2, CO3, CO4, and CO5 contribute to the development of students' research related skills. For example, CO5 requires students to learn how to perform different methods of microbial analysis. CO7 requires student to learn to demonstrate different isolation of pure culture techniques.

PO3 Employability Skills

CO2, CO3, CO4, CO5, CO6 and CO7 all contribute to the development of students' professional competence. For example, all of the COs require students to develop their ability to work independently and as part of a team.

PO5 Ethical and Social Responsibility:
CO2, CO3, CO5 contribute towards the development of ethics in Microbiology of milk and milk products.

PO9 Multidisciplinary studies:

All of the course outcomes (COs) contribute to the development of students' life long learning in Dairy Technology. For example, CO1, CO2, CO3, CO4 and CO5 require students to get lifelong knowledge about microbiology of milk and milk products. CO6 and CO7 require students to get knowledge about methods of staining and methods of isolation of pure starter culture.

PO10 Community Engagement:

CO2.They will understand the microorganisms of commercial importance.

Topics and Learning Points	
1. Introduction to basic microbiology laboratory equipments	**6P**
2. Study of instruments used in microbiology lab	**6P**
3. Study of compound microscope	**6P**
4. Study of sterilization of glassware's	**6P**
5. Preparation of nutrient agar media	**6P**
6. Preparation of nutrient broth media	**6P**
7. Preparation of Mac-Conkeys media	**6P**
8. Preparation of PDA media	**6P**
9. Cleaning and methods of sterilization	**6P**
10. Activity	**6P**

References:

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : F. Y. B Voc. Dairy Technology

Programme Code : DRT

Class : F. Y. B Voc.

Semester : I

Course Type : Open Elective (OE)

Course Code : DRT-107-OE (T)

Course Title : Introduction to Milk Processing

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

- To learn about the concept of Dairy Technology.
- To know about the importance of milk processing.
- To understand different types of milk quality tests in dairy industry.
- To know the processing of milk in dairy industry.
- To understand about milk preservation techniques.
- To study about manufacturing of different types of milk available in market.
- To study about packaging of milk and milk products.

Course Outcomes:

By the end of the course, students will be able to:

CO1: Concept of Dairy Technology.

CO2: Importance of milk processing.

CO3: Identify and perform different types of quality tests for milk.

CO4: Processing of Milk in Dairy Industries.

CO5: Different milk preservation techniques.

CO6: Manufacturing process of different types of milk like flavored milk, tonned milk, sterilized milk, rehydrated milk, etc.

CO7: Packaging of milk and milk products.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	3	3	2	1	1	3	3	
CO2	2		2	3				3	3	3
CO3		2				1				
CO4	2		2		3			3		2
CO5		3	2	2	2		1		3	
CO6	2	2	1	2	1	1	1	3	3	3
CO7	3	2	2		2			3	2	

Justification for the mapping

PSO1: Technical Competence:

All of the course outcomes (COs) contribute to the development of students' disciplinary knowledge in Dairy Technology. For example, CO1, CO2, and CO3 require students to get knowledge about different milk processes, types of milk and milk storage. CO6 require students to apply suitable methods of pasteurizing milk.

PO2 Problem Solving Skills

All of the COs also contribute to the development of students' critical thinking and problem-solving skills. For example, CO1, CO2, and CO3 require students to think critically about milk processing, storage and types of milk. CO5 require students to become capable to solve processing related errors.

PO3 Employability Skills :

CO1, CO2 and CO4 contribute to the development of students' research-related skills and scientific temper towards milk processing and types of milk. For example, CO2 requires students to learn different types of milk. CO4 require students to develop their ability to think critically about fundamentals of milk processing

.

PO4 Industry Relevance and entrepreneurial abilities

CO2, CO3, CO4, and CO5 all contribute to the development of students' personal and professional competence. For example, all of the COs require students to know about milk processing and storage and to develop their ability to work independently and as part of a team.

PO5 Ethical and Social Responsibility:

CO2, CO3, CO5 contribute towards the development of ethics in processing of milk.

PO7 Research and Innovations :

CO1, CO2, CO3, CO4, and CO5 contribute to the development of students' research related skills. For example, CO1 requires students to learn how to apply different methods processing of milk. CO5 requires student to learn about different methods of pasteurization of milk.

PO9 Multidisciplinary studies:

All of the course outcomes (COs) contribute to the development of students' lifelong learning in processing of milk. For example, CO1, CO2, and CO3 require students to get lifelong knowledge about processing of milk and storage of milk and milk products. CO4 and CO5 require students to get knowledge about problem solving related to processing and learn about different methods of pasteurization.

PO10 Community Engagement:
CO2: Importance of milk processing.
CO4: Processing of Milk in Dairy Industries.
CO6: Manufacturing process of different types of milk like flavored milk, tonned milk, sterilized milk, rehydrated milk, etc.
All above CO's contribute to PO10: Community Engagement.

Topics and Learning Points

Unit-1: Milk Reception: Milk Collection and Transportation, Milk Reception at the Dairy Dock, Milk Chilling and Storage **7 Periods**

Unit-2: Processing of milk: Filtration, Preheating, Standardization, Pasteurization and Homogenization **8 Periods**

Unit-3: Sterilization and Ultra-High-Temperature Processing
Definition of sterilization, Quality of sterilized milk, Ultra-High temperature processing definition, Aseptic packaging, Types of packaging materials, Description of aseptic packaging systems. **8 Periods**

Unit-4: Special Milks: Flavored milk, toned milk, double toned milk, Standardized milk, and rehydrated milk, recombinant milk.

7 Periods

References:

1. Krause's food & the nutrition care process / [edited by] L. Kathleen Mahan.
2. Outlines of Dairy Technology – Sukumar De
3. Handbook of Nutrition and Food, Third Edition by Carolyn D.
4. Manual of Nutritional Therapeutics by David H.

CBCS Syllabus as per NEP 2020 for F. Y. B. Voc. Dairy Technology (2025 Pattern)

Name of the Programme : F. Y. B Voc. Dairy Technology

Programme Code : DRT

Class : F. Y. B Voc.

Semester : I

Course Type : Skill Enhancement Course (SEC)

Course Code : DRT-108-SEC

Course Title : Soft skill Development

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

- Students will achieve stage daring.
- They will be able to communicate fluently.
- They will get acquainted with the professional format of conversation.
- They will be able to create an impact with the verbal communication.
- They will understand the difference between formal and informal communication.
- They will able to develop their personality.
- They will be able to explore formal communication mediums

Course Outcomes:

By the end of the course, students will be able to:

CO1. Establish and achieve stage daring.

CO2. Students will communicate fluently.

CO3. Actively participate in debates and group discussion.

CO4. Understand features and characteristic of a good personality.

CO5. Create and demonstrate effective formal communication.

CO6. Develop their personality.

CO7: Explore formal communication mediums.

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

	Programme Outcomes(POs)									
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3							2		
CO2	2							2		

CO3	3									3
CO4		3				3				
CO5			2							2
CO6			3		3					2
CO7				3			2		3	

Justification for the mapping

PO1 Technical Competence:
CO1: Students will acquire knowledge and skills necessary for stage daring.
CO2: They will comprehend and apply effective communication strategies fluently.
CO3: They will understand and adhere to the professional format of conversation in their discipline.

PO2 Problem Solving Skills :
CO4: Students will demonstrate the ability to create a substantial impact with verbal communication, showcasing critical thinking skills.

PO7 Research and Innovations :
CO7: They will explore and utilize formal communication mediums for research purposes.

PO3 Employability Skills :
CO6: Students will develop their personality through effective communication practices, contributing to personal and professional competence.

PO5 Ethical and Social Responsibility:
CO4: They will be able to create a significant impact with verbal communication while adhering to ethical principles.

PO6 Environmental Awareness:
CO7: They will explore and utilize formal communication mediums ethically, contributing to environmental sustainability.

PO8 Global Perspective

CO1. Establish and achieve stage daring.
CO2. Students will communicate fluently.

PO9 Multidisciplinary studies:
CO8: Through their journey of developing effective communication skills, students will cultivate a commitment to self-directed and lifelong learning.

PO10 Community Engagement:
CO3. Actively participate in debates and group discussion.
CO5. Create and demonstrate effective formal communication.
CO7: Explore formal communication mediums.

Topics and Learning Points

Unit 1 Fluency in Grammar Usage **5P**

1) Tenses
2) Verbs
3) Active & Passive Voice
4) Reported Speech
5) Prepositions
6) Conjunctions
7) Effective Sentence-Construction
8) Vocabulary

Unit 2 Fundamentals **5P**

1) Greeting and taking leave
2) Introducing yourself
3) Introducing people to one another
4) Making requests and asking for directions
5) Congratulating, expressing sympathy and offering condolence
6) Making suggestions and offering advice
7) Making and accepting an apology

Unit 3 Situational dialogues **5P**

Unit 4 Personality development **5P**

Unit 5 Interview and Group discussion **5P**

Unit 6 Writing and comprehension skills **5P**

1) Letter (Formal) and Email
2) Report
3) Summarizing reports, articles, editorials
4) Making an abstract
5) Review writing
6) Writing resume

Activity – (Square talks, back and back conversations, listening and writing)