



**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

S. Y. B. Voc. Dairy Technology Semester -III

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 third semester of S. 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 21st century. 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 20th April and 16th May 2023, and the Circular issued by SPPU, Pune on 31st May 2023.

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. | Ms. Pawar Aishwarya R. Assistant Professor, Department of Dairy Technology, T. C. College, Baramati | Member |
| 5. | Mrs. Sujata Patil | Vice-Chancellor Nominee Subject Expert from SPPU, Pune |
| 6. | Dr. Khojare Ajit S. | Subject Expert from Outside the Parent University |
| 7. | Dr. Pathan Fayaz L. | Subject Expert from Outside the Parent University |
| 8. | Mr. Bhapkar Sandeep | Representative from industry/corporate sector/allied areas |
| 9. | Mr. Chavan Shubham | Member of the College Alumni |
| 10. | Mr. Shrey Chavan | UG Student |

Credit Distribution Structure for S. Y. B. Voc. – 2026 – 2027 (Dairy Technology)

| Level | Semester | Major | | Minor | OE | VSC,SEC, (VSEC) | AEC,VEC,IKS | OJT, FP,CEP, CC,RP | Cum. Cr/Sem | Degree/Cu m.Cr. |
|-------|----------|--|-----------|---|---|--|---|-------------------------------------|----------------|--------------------------|
| | | Mandatory | Electives | | | | | | | |
| 4.5 | III | DRT-201-MRM: Dairy Processing Equipment (2credits) | - | DRT -206-MN: Food Preservation Technology (2credits) | DRT -208-OE: Indian Dairy Products (2credits) | DRT -204-VSC: Entrepreneurship Development (2credits) | MAR/HIN-210-AEC Marathi/Hindi (2credit) | DRT-205-FP: Field Project (2credit) | 22 | UG Certificate 44credits |
| | | DRT -202-MRM: Fermented Milk Products (2credits) | - | | | | | | | |
| | | DRT -203-MRM: Lab Course -I (2credits) | | DRT -207-MN: Practical's of Food Preservation Technology (2credits) | | DRT -209-IKS: History Of Indian Dairy Development (2credits) | YOG/PES/CUL/NSS/NC C-211-CC (2credit) | | | |
| | | | | | | | | | | |

| | | | | | | | | | |
|---------|---|---|--|--|--|---|---|----|--|
| IV | DRT -251-MRM: Dairy Engineering (2 credits) | - | DRT -256-MN: Nutrition Science (2credits) | DRT -258-OE: Practical's of Indian Dairy Products (2credits) | DRT-254-VSC: Detection of Food Adulteration (2credits) | MAR/HIN-260-AEC Marathi/Hindi - II(2credit) | DRT-255-CEP: Community Engagement Program | 22 | |
| | DRT -252-MRM: Traditional Indian Dairy Products (2 credits) | | | | | | | | |
| | DRT -253-MRM: Lab Course- II (2 credits) | | DRT -257-MN: Practical's of Nutrition Science (2credits) | | DRT -259-SEC Sensory Evaluation of Milk & Milk Products (2credits) | | YOG/PES/CUL/NSS/NC C-261-CC (2credit) | | |
| Cum Cr. | 12 | - | 8 | 4 | 6 | 6 | 8 | 44 | |

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Course Structure for F. Y. and S. 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 - 154 - 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 |

| Sem. | Course Type | Course Code | Course Name | Theory / Practical | Credits |
|---|--|---|---|---------------------|-----------|
| III | Major (Mandatory) | DRT-201-MRM | Dairy Processing Equipment | Theory | 02 |
| | | DRT -202- MRM | Fermented Milk Products | Theory | 02 |
| | | DRT -203- MRM | Lab Course-I | Practical | 02 |
| | Vocational Skill Course (VSC) | DRT -204-VSC | Entrepreneurship Development | Practical | 02 |
| | Field Project (FP) | DRT -205- FP | Field Project | Practical | 02 |
| | Minor | DRT -206-MN | Food Preservation Technology | Theory | 02 |
| | | DRT -207-MN | Practical's of Food Preservation Technology | Practical | 02 |
| | Open Elective (OE) | DRT -208-OE | Indian Dairy Products | Theory | 02 |
| | Subject Specific Indian Knowledge System (IKS) | DRT -209-IKS | History of Indian Dairy Development | Theory | 02 |
| | Ability Enhancement Course (AEC) | MAR-210-AEC HIN-210-AEC | मराठीभाषेची कौशल्ये-१ हिंदीभाषा: सृजनकौशल्य | Theory (Any One) | 02 |
| Co-curricular Course (CC) | YOG/PES/CUL/ NSS/NCC-211-CC | To be continued from the Semester - II | | 02 | |
| Total Credits Semester-III | | | | | 22 |
| IV | Major (Mandatory) | DRT -251- MRM | Dairy Engineering | Theory | 02 |
| | | DRT -252- MRM | Traditional Indian Dairy Products | Theory | 02 |
| | | DRT - 253- MRM | Lab Course-II | Practical | 02 |
| | Vocational Skill Course (VSC) | DRT -254-VSC | Detection of Food Adulteration | Practical | 02 |
| | Community Engagement Project (CEP) | DRT -255- CEP | Community Engagement Project | Practical | 02 |
| | Minor | DRT -256-MN | Nutrition Science | Theory | 02 |
| | | DRT -257-MN | Practical's of Nutrition Science | Practical | 02 |
| | Open Elective (OE) | DRT -258-OE | Practical's of Indian Dairy Products | Practical | 02 |
| | Skill Enhancement Course (SEC) | DRT -259-SEC | Sensory Evaluation of Milk & Milk Products | Practical | 02 |
| | Ability Enhancement Course (AEC) | MAR-260-AEC HIN-260-AEC | मराठीभाषेचीकौशल्ये-२ हिंदीभाषा: संप्रेषणकौशल्य | Theory (Any One) | 02 |
| Co-curricular Course (CC) | YOG/PES/CUL/ NSS/NCC-261-CC | To be continued from the Semester - III | | 02 | |
| Total Credits Semester IV | | | | | 22 |
| Cumulative Credits Semester III and IV | | | | | 44 |

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

| | |
|------------------------------|------------------------------|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S. Y. B. Voc. |
| Semester | : III |
| Course Type | : Major Mandatory |
| Course Code | : DRT-201-MRM |
| Course Title | : Dairy Processing Equipment |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 30 |

Course Objectives:

1. To understand type of materials used for making of an equipment in dairy industry.
2. To know about operations of equipment in a dairy industry.
3. To identify and define working of a dairy equipment.
4. To know about maintenance of Equipment.
5. To understand the design and working of pumps, and other processing Equipment.
6. To know about how to assemble different parts of equipments.
7. To achieve technical knowledge in operating and maintaining different equipments.

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

CO1. Students will get exposure to various equipments used for milk processing.

CO2. They will achieve the knowledge about different pipes and pumps used in the industry.

CO3. They will be able to assemble different parts of equipments.

CO4. They will be able to understand the working principle of machinery which is used in dairy industry.

CO5. They will be able to operate the equipments & maintenance of equipments with technical knowledge.

CO6. They will understand design and working of processing equipments.

CO7. They will be able to identify different types processing equipments.

Topics and Learning Points

Unit-1 Milk reception equipments

Working and maintenance of milk reception equipment: Tipping tank, Storage tank, Can washer. Study of Filter and Clarifier, Plate and Frame filter press, Bactofugation equipment, Tri-Process machine **07P**

Unit-2 Milk processing equipments-I

Cream Separator- Principle, construction and working, Homogenizer: Theory of homogenization, Single & Two stage homogenizer, Design of homogenizing valve, Efficiency of homogenization, Mixing of Liquid-liquid and different devices **08 P**

Unit-3 Milk processing equipments-II

Pasteurizers, Sterilizers, Butter churners – Types, Installation, Working & Maintenance, Ice-Cream freezers-Types & working, Ghee Vat, Paneer Equipments, Bottle filling machine, Carbonation unit **08 P**

Unit-4 Cleaning & Sanitation:

Materials and sanitary features of the dairy & food equipment, Sanitary pipes and fittings, Pumps: Types, care & maintenance, Cleaning & Sanitizing Agents, Cleaning in Place (CIP) **07 P**

References:

- Dairy engineering Technology and engineering of Dairy Plant Operation- Anantkrishnan C.P. Simha N.N. (1987)
- Walstra, P., Wouters, J., & Guerts, T. (2005). Dairy Science and Technology (2nd ed.). CRC Press.
- Britz, T.J., & Robinson, R.K. (Eds.). (2008). Advanced Dairy Science and Technology. Blackwell Publishing.

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

| | | | |
|---------------|------------------------------|--------------------|--------------------|
| Class | : S. Y. B. Voc. (Sem-III) | Subject | : Dairy Technology |
| Course | : Dairy Processing Equipment | Course Code | : DRT-201-MRM |

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 | PO10 |
| CO1 | 3 | 1 | 2 | 1 | 3 | 3 | 2 | 3 | 1 | 3 |
| CO2 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 3 | 1 | 2 |
| CO3 | 2 | 2 | 1 | 2 | 3 | 1 | 1 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 1 |
| CO5 | 3 | 2 | 3 | 1 | 1 | 3 | 2 | 3 | 1 | 2 |
| CO6 | 1 | 3 | 1 | 2 | 1 | 1 | 3 | 3 | 1 | 1 |
| CO7 | 1 | 3 | 1 | 1 | 2 | 1 | 1 | 3 | 1 | 1 |

Justification for the mapping

PO1: Disciplinary Knowledge:

CO1: Gain foundational knowledge of various equipments utilized in milk processing.

CO2: Acquire understanding about different pipes and pumps employed in the dairy industry.

CO3: Develop proficiency in assembling various parts of processing equipments.

CO4: Comprehend the working principles of machinery prevalent in the dairy industry.

CO5: Operate and maintain equipments effectively with technical expertise.

PO2: Critical Thinking and Problem Solving:

CO6: Analyze the design and functioning of processing equipments, fostering critical thinking skills.

CO7: Identify and differentiate between various types of processing equipments, promoting problem-solving abilities.

PO4: Research-Related Skills:

CO3: Develop proficiency in assembling various parts of processing equipments.

CO4: Comprehend the working principles of machinery prevalent in the dairy industry.

PO5: Personal and Professional Competence:

CO1: Gain foundational knowledge of various equipments utilized in milk processing.

CO3: Develop proficiency in assembling various parts of processing equipments.

PO6: Effective Citizenship and Ethics:

CO1: Gain foundational knowledge of various equipments utilized in milk processing.

CO2: Acquire understanding about different pipes and pumps employed in the dairy industry.

CO5: Operate and maintain equipments effectively with technical expertise.

PO8: Self-directed and Life-long Learning:

CO1: Gain foundational knowledge of various equipments utilized in milk processing.

CO2: Acquire understanding about different pipes and pumps employed in the dairy industry.

CO3: Develop proficiency in assembling various parts of processing equipments.

CO4: Comprehend the working principles of machinery prevalent in the dairy industry.

CO5: Operate and maintain equipments effectively with technical expertise.

CO6: Analyze the design and functioning of processing equipments, fostering critical thinking skills.

CO7: Identify and differentiate between various types of processing equipments, promoting problem-solving abilities.

PO9: Trans-disciplinary Research Competence:

CO3: Develop proficiency in assembling various parts of processing equipments.

CO4: Comprehend the working principles of machinery prevalent in the dairy industry.

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

| | |
|------------------------------|----------------------------|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Major Mandatory |
| Course Code | : DRT -202-MRM |
| Course Title | : Fermented Milk Products |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 30 |

Course Objectives:

1. To learn basics of Fermentations, Starter cultures, and Fermentor
2. To understand the function of a starter culture
3. To know the advantages and importance of fermentation
4. To learn making process of various western fermented milk products
5. To learn making process of various Indian fermented milk products
6. To learn about nutritional values of fermented products.
7. To learn Principles of cheese making.

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

- CO1.**Students will get an exposure towards fermented class of milk products.
- CO2.**They will know the importance of fermented milk products.
- CO3.**They will acquire information on fermentation process and products.
- CO4.**They will be able to understand processing of cheese along with some other fermented products.
- CO5.**They will be able to understand the function of microorganisms in Dairy products.
- CO6.**They will learn principle of cheese making.
- CO7.**They will be able to understand basics of fermentation, starter culture and fermentors.

Topics and Learning Points**Unit-1- Introduction to fermentation**

Definition, Types of fermentation, Design and working of Fermentor, Characteristics of fermented milk products, Nutritional importance, need, and benefits of fermented milk products.

07 Periods**Unit-2- Starter Culture**

Definition and classification of Starter culture, Types and importance, Role and function of Starter culture, properties of good starter. Defects in starter culture

07 Periods

Unit 3- Indian Fermented Milk Products

Varieties of Indian fermented milk products: Dahi, Mishti Dahi, Buttermilk, Lassi, Chakka, Shrikhand, Shrikhand wadi

08 Periods**Unit 4- Western Fermented Milk Products**

Varieties of western fermented milk products: Yoghurt, Kefir, Kumis, Bulgarian butter milk, Acidophilus milk, Yakult.

08 Periods**References:**

1. Outlines of Dairy Technology, (1980) Sukumar De
2. Cultured milk products in CRC handbook (1982) Chandan R.C, Shahani K.K.
3. Yogurt Science and Technology (2004) Tamime A.Y. and Robinson R.K.

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes**Class** : S. Y. B. Voc. (Sem-III)**Subject** : Dairy Technology**Course** : Fermented Milk Products**Course Code** : DRT-202-MRM**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 | PO10 |
| CO1 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 3 | 1 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 1 | 1 | 1 | 3 | 1 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 3 |
| CO5 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO6 | 2 | 3 | 3 | 1 | 3 | 1 | 1 | 3 | 2 | 2 |
| CO7 | 2 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 1 | 3 |

Justification for the mapping**PO1: Disciplinary Knowledge**

CO1: Develop an understanding of the fermented class of milk products through practical exposure.

CO2: Evaluate and recognize the significance of fermented milk products in the context of nutrition and health.

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

CO5: Demonstrate comprehension of the role of microorganisms in dairy products and their impact on product quality..

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO2: Critical Thinking and Problem Solving

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

CO5: Demonstrate comprehension of the role of microorganisms in dairy products and their impact on product quality..

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

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

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO4: Research-Related Skills

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

PO5: Personal and Professional Competence

CO2: Evaluate and recognize the significance of fermented milk products in the context of nutrition and health.

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO7: Environment and Sustainability

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO8: Self-directed and Life-long Learning

CO1: Develop an understanding of the fermented class of milk products through practical exposure.

CO2: Evaluate and recognize the significance of fermented milk products in the context of nutrition and health.

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

CO5: Demonstrate comprehension of the role of microorganisms in dairy products and their impact on product quality..

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO9: Trans-disciplinary Research Competence

CO1: Develop an understanding of the fermented class of milk products through practical exposure.

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

| | |
|------------------------------|----------------------------|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Major Mandatory |
| Course Code | : DRT -203-MRM |
| Course Title | : Lab Course-I |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 30 |

Course Objectives:

1. To learn basics of manufacture of fermented milk products.
2. To understand process flow of the manufacture of fermented milk products.
3. To know the advantages and importance of fermentation
4. To learn the storage requirements of fermented milk products
5. To learn the manufacture and varieties of Cheese.
6. To know about operations of equipment in a dairy industry.
7. To know about maintenance of Equipment.

Course Outcomes:

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

CO1.Students will get an exposure towards fermented class of milk products.

CO2.They will know the importance of fermented milk products.

CO3.They will acquire information on fermentation process and products.

CO4.They will be able to understand processing of cheese along with some other fermented products.

CO5.They will learn principle of cheese making.

CO6. They will understand design and working of processing equipments.

CO7. Students will get exposure to various equipments used for milk processing.

Topics and Learning Points

- 1) Preparation of Dahi
- 2) Preparation of Mishti Dahi
- 3) Preparation of Yogurt
- 4) Preparation of Lassi
- 5) Preparation of Chakka
- 6) Preparation of Shrikhand
- 7) Preparation of Mozerella cheese

- 8) Preparation of Processed cheese & spread
- 9) Study of Fermentor
- 10) Study of Cream separator.
- 11) Study of Freezer
- 12) Study of Butter Churner

References:

1. Outlines of Dairy Technology, (1980) Sukumar De
2. Cultured milk products in CRC handbook (1982) Chandan R.C, Shahani K.K
3. Dairy engineering Technology and engineering of Dairy Plant Operation- Anantkrishnan C.P. Simha N.N. (1987)

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class : S. Y. B. Voc. (Sem-III)

Subject : Dairy Technology

Course : Lab Course- I

Course Code : DRT-203-MRM

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 | PO10 |
| CO1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 2 |
| CO2 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 1 | 3 | 1 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 |
| CO5 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO6 | 2 | 3 | 1 | 1 | 3 | 2 | 3 | 3 | 2 | 2 |
| CO7 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 1 |

Justification for the mapping

PO1: Disciplinary Knowledge

CO1: Develop an understanding of the fermented class of milk products through practical exposure.

CO2: Evaluate and recognize the significance of fermented milk products in the context of nutrition and health.

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

CO5: Demonstrate comprehension of the role of microorganisms in dairy products and their

impact on product quality..

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO2: Critical Thinking and Problem Solving

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

CO5: Demonstrate comprehension of the role of microorganisms in dairy products and their impact on product quality..

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO3: Social Competence

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO4: Research-Related Skills

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

PO5: Personal and Professional Competence

CO2: Evaluate and recognize the significance of fermented milk products in the context of nutrition and health.

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO7: Environment and Sustainability

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO8: Self-directed and Life-long Learning

CO1: Develop an understanding of the fermented class of milk products through practical exposure.

CO2: Evaluate and recognize the significance of fermented milk products in the context of nutrition and health.

CO3: Communicate information on the fermentation process and its products with clarity and precision.

CO4: Conduct research to comprehend the processing of cheese and other fermented products in the dairy industry.

CO5: Demonstrate comprehension of the role of microorganisms in dairy products and their impact on product quality..

CO6: Reflect on and appreciate the ethical considerations in cheese making and the production of fermented products.

CO7: Explore the environmental implications of fermentation, starter culture usage, and fermentors in the dairy industry.

PO9: Trans-disciplinary Research Competence

CO1: Develop an understanding of the fermented class of milk products through practical Exposure.

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

| | |
|------------------------------|---------------------------------|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Vocational Skill Course (VSC) |
| Course Code | : DRT -204-VSC |
| Course Title | : Entrepreneurship Development |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 60 |

Course Objectives:

1. To understand the concept of entrepreneurship.
2. To learn key skills for being a successful entrepreneur.
3. To understand the basics for their start-ups.
4. To understand the laws and regulations for the industries.
5. To know about the institutes working for entrepreneurial support.
6. To understand the market survey and opportunities.
7. To learn about making of project reports.

Course Outcomes:

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

- CO1.**Students will get some basic guidance for their start-up.
- CO2.**They will be aware of all the institutes working for entrepreneurial support.
- CO3.**They will be able to structure their project reports.
- CO4.**They will understand the qualities and traits needed for entrepreneurship.
- CO5.**They will be educated towards laws and regulations for the industries.
- CO6.**They will understand concept of entrepreneurship.
- CO7.**They will learn skills for being a successful entrepreneur.

Topics and Learning Points

- 1) Study of concept of entrepreneurship
- 2) Study of need entrepreneurship development
- 3) Study of quality of entrepreneurs, rewards and penalties for entrepreneur
- 4) Study district industry center (DIC's)

- 5) Study of role of commercial bank for financial assistance
- 6) Study of project report preparation
- 7) Study of business planning
- 8) Study of procedure for starting small scale industry
- 9) Study of identification of business opportunities and process of final product selection
- 10) Study of principle of taxation
- 11) Study of Factory act 1948

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.
- EDI study material, EDI, BHAT, Ahmedabad, Website : <http://www.ediindia.com>

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes**Class** : S. Y. B. Voc. (Sem-III)**Subject** : Dairy Technology**Course** : Entrepreneurship Development**Course Code** : DRT-204-VSC**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 | PO10 |
| CO1 | 2 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 3 | 3 |
| CO2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 |
| CO3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 1 |
| CO4 | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 2 | 2 | 1 |
| CO5 | 1 | 1 | 3 | 2 | 1 | 3 | 1 | 1 | 1 | 2 |
| CO6 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 2 | 1 |
| CO7 | 1 | 3 | 2 | 1 | 3 | 3 | 3 | 1 | 1 | 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 Entrepreneurship.

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

| | |
|------------------------------|--------------------------------|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Minor |
| Course Code | : DRT -206-MN |
| Course Title | : Food Preservation Technology |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 30 |

Course Objectives:

- To study methods of preservation of foods
- To study the natural and chemical preservatives i. e. class I and class II preservatives
- To study effect of different physical parameters on food
- To learn how to improve quality of food
- To learn how to enhance the shelf life of the products
- To study about variety of preservatives which are used commercially
- To study different methods of food processing.

Course Outcomes:

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

- CO1.** Students will be able to apply different preservation techniques to the food.
CO2. They will understand the processing of food through various processes.
CO3. They will learn about effect of different physical parameters on food.
CO4. They will learn about the variety of preservatives that are used commercially.
CO5. They will be able to improve quality of food.
CO6. They will be able to study class- I and class- II preservatives.
CO7. They will be able to enhance the shelf life of the product.

Topics and Learning Points

Unit-1: Introduction to preservation: Definition, Introduction to preservation, History of preservation, general principles of food preservation, Definition of preservative, Types of preservatives - Class I & Class II, **08 Periods**

Unit-2: Food Preservation by low temperature:

Introduction to preservation by low temperature, Refrigeration, Chilling and super chilling, Freezing and Freeze Drying, Cryogenic preservation **07 Periods**

Unit-3: Food preservation by High Temperature:

Introduction to preservation by heating, Pasteurization, Sterilization, Blanching, Drying,

Dehydration Canning,

07 Periods**Unit-4: Non thermal food preservation:** Introduction to non thermal preservation, Ohmic heating, Irradiation, Microwave heating, Membrane technology, Hurdle technology**08 Periods****References:**

- Arsdel W.B., Copley, M.J. and Morgen, A.I. 1973. Food Dehydration. AVI, Westport.
 Hosahalli S. Ramaswamy, Michele Marcotte. 2005. Food Processing: Principles and Applications. CRC Press. Taylor & Francis Group. Boca Raton, Finland.
 Fellows, P. and Ellis H. 1990. Food Processing Technology: Principles and Practice, New York.
 Jelen, P. 1985. Introduction to Food Processing. Prentice Hall, Reston Virginia, USA. Norman

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class : S. Y. B. Voc. (Sem-III) **Subject** : Dairy Technology
Course : Food Preservation Technology **Course Code** : DRT-206-MN

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 | PO10 |
| CO1 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 2 | 3 |
| CO2 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO3 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 1 |
| CO5 | 2 | 3 | 2 | 1 | 3 | 1 | 1 | 1 | 2 | 2 |
| CO6 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | 2 |
| CO7 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |

Justification for the mapping**PO1: Disciplinary Knowledge:**

CO1: Students will acquire knowledge on the science and principles of food preservation.

CO2: They will comprehend various methods and processes employed in food preservation.

PO2: Critical Thinking and Problem Solving:

CO4: Students will analyze and choose the most suitable preservation technique based on critical evaluation.

PO3: Social Competence:

CO3: They will be able to demonstrate pre-preparation actions, considering social and cultural contexts.

PO4: Research-Related Skills:

CO6: Students will research and learn about different types of preservatives.

PO5: Personal and Professional Competence:

CO5: They will enhance the shelf life of food, showcasing personal and professional competence.

PO6: Effective Citizenship and Ethics:

CO7: They will understand and adhere to ethical considerations in different methods of food preservation.

PO7: Environment and Sustainability:

CO2: They will comprehend the environmental impact of different food preservation processes.

PO8: Self-directed and Life-long Learning:

CO1: Students will independently gather information on the preservation of food.

CO6: They will continue to learn and adapt to new types of preservatives throughout their professional life.

PO9: Trans-disciplinary Research Competence:

CO4: Students will explore trans-disciplinary aspects related to food preservation techniques

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

| | |
|------------------------------|---|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Minor |
| Course Code | : DRT -207-MN |
| Course Title | : Practical's of Food Preservation Technology |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 60 |

Course Objectives:

- To study methods of preservation of foods
- To study the natural and chemical preservatives i. e. class I and class II preservatives
- To study effect of different physical parameters on food
- To learn how to improve quality of food
- To learn how to enhance the shelf life of the products
- To study about variety of preservatives which are used commercially
- To study different methods of food processing.

Course Outcomes:

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

- CO1.** Students will be able to apply different preservation techniques to the food.
- CO2.** They will understand the processing of food through various processes.
- CO3.** They will learn about effect of different physical parameters on food.
- CO4.** They will learn about the variety of preservatives that are used commercially.
- CO5.** They will be able to improve quality of food.
- CO6.** They will be able to study class- I and class- II preservatives.
- CO7.** They will be able to enhance the shelf life of the product.

Topics and Learning Points

1. Study of class I and class II preservatives
2. Preservation by Salt (Pickle and fish)
3. Preservation by Sugar (Jam, Jelly)
4. Preservation by Oil (Vegetable pickle)

5. Preservation by Chemical preservative (Squash, Ketchup)
6. Preservation by Low temperature (Chilling and freezing peas)
7. Preservation by High temperature (Blanching, Pasteurization)
Vegetables, Fruits, Milk
8. Preservation by Drying (Sun and mechanical) Spinach, Grapes
9. Preservation by Use of acidulants: Preparation of tomato products
10. Preservation by Osmotic dehydration

References:

- Handbook of Food preservation (1999) M. Shafiur Rahman CRC Press
- Food Preservation techniques (2003) Peter Zeuthen
- The Technology of food preservation 4th Edition (2006) Norman W. Desroier

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class : S. Y. B. Voc. (Sem-III)

Subject : Dairy Technology

Course : Practical of Food Preservation Technology

Course Code : DRT-207-MN

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

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

Justification for the mapping**PO1: Disciplinary Knowledge:**

CO1: Students will acquire knowledge on the science and principles of food preservation.

CO2: They will comprehend various methods and processes employed in food preservation.

PO2: Critical Thinking and Problem Solving:

CO4: Students will analyze and choose the most suitable preservation technique based on critical evaluation.

PO3: Social Competence:

CO3: They will be able to demonstrate pre-preparation actions, considering social and cultural contexts.

PO4: Research-Related Skills:

CO6: Students will research and learn about different types of preservatives.

PO5: Personal and Professional Competence:

CO5: They will enhance the shelf life of food, showcasing personal and professional competence.

PO6: Effective Citizenship and Ethics:

CO7: They will understand and adhere to ethical considerations in different methods of food preservation.

PO7: Environment and Sustainability:

CO2: They will comprehend the environmental impact of different food preservation processes.

PO8: Self-directed and Life-long Learning:

CO1: Students will independently gather information on the preservation of food.

CO6: They will continue to learn and adapt to new types of preservatives throughout their professional life.

PO9: Trans-disciplinary Research Competence:

CO4: Students will explore trans-disciplinary aspects related to food preservation techniques

PO10 Community Engagement:

CO2: They will understand the microorganisms of commercial importance.

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

| | |
|------------------------------|----------------------------|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Open Elective |
| Course Code | : DRT -208-OE |
| Course Title | : Indian Dairy Products |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 30 |

Course Objectives:

1. To know importance of indigenous milk product and its market demand
2. To learn the making process of different indigenous milk products
3. To study defects of the products and prevention
4. To know about manufacturing process of different traditional Indian dairy products
5. To learn the nutritional value and importance of traditional Indian dairy products
6. To know the market demand for different indigenous products
7. To study judging and grading of indigenous milk products.

Course Outcomes:

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

- CO1.** Students will get an exposure towards traditional Indian dairy products.
- CO2.** They will know the importance of traditional Indian dairy products.
- CO3.** They will acquire information on process of product manufacturing and its nutritional value.
- CO4.** They will be able to understand processing of heat desiccated, heat and acid coagulated, fat rich products along with judging and grading of indigenous milk products.
- CO5.** They will know importance of indigenous milk product and its market demand.
- CO6.** They will learn different making process of indigenous milk product.
- CO7.** They will study judging and grading of indigenous milk products.

Topics and Learning Points

Unit 1- Heat desiccated products**7P**

Definition, Composition, Types and standards of Khoa

Methods of manufacture and factors affecting quality of products

Khoa based sweets.

Unit 2- Paneer and Channa**8P**

Definition, Composition, Standards and Factors affecting quality of Paneer and Channa,

Methods of manufacturing Paneer and Channa, Channa based sweets

Unit 3- Traditional Indian Product**7P**

Definition, standards and nutritive value and methods of manufacture and use of

Basundi, Kheer, Rabdi, Khurchan.

Unit 4 Fat Rich Products**8P**

Ghee and Makkhan (Loni) Definition, Composition and standards, Methods of manufacturing

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.

Choice Based Credit System Syllabus (2025 Pattern)
(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class : S. Y. B. Voc. (Sem-III)**Subject** : Dairy Technology**Course** : Indian Dairy Products**Course Code** : DRT-208-OE**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 | PO10 |
| CO1 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 1 |

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

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 student 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 developing 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.

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

| | |
|------------------------------|--|
| Name of the Programme | : B. Voc. Dairy Technology |
| Programme Code | : DRT |
| Class | : S .Y. B. Voc. |
| Semester | : III |
| Course Type | : Subject Specific Indian Knowledge System |
| Course Code | : DRT -209-IKS |
| Course Title | : History of Indian Dairy Development |
| No. of Credits | : 02 |
| No. of Teaching Hours | : 30 |

Course Objectives:

1. To introduce students to the ancient Indian knowledge and practices related to dairy technology.
2. To provide a historical perspective on dairy animal management and milk processing techniques.
3. To understand the scientific principles behind ancient Indian dairy practices.
4. To explore the diverse range of dairy products produced in ancient India.
5. To examine the cultural and socio-economic significance of dairy technology in ancient Indian society.
6. To study judging and grading of indigenous milk products.
7. To study about three phases of operation flood.

Course Outcomes:

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

CO1. Understand ancient Indian Knowledge related to Dairy Technology.

CO2. Know historical development of Milk Processing.

CO3. Understand the specific principles behind Indian Dairy practices.

CO4. Understand and identify wide range of dairy products in ancient time.

CO5. Analyze the cultural & socio-economic significance of dairy technology in ancient Indian society.

CO6. Study judging and grading of indigenous milk products.

CO7. Understand three phases of operation flood.

Topics and Learning Points

Unit 1- Introduction to History Dairy Development

Dairy Development in Pre-Independence Period,
Dairy Development from 1947-1970 - Government Projects, Non-Government
Organization Councils, Institutes and Associations, International and Foreign
Agencies **7P**

Unit 2- Dairy Development from 1970 Onwards

Dairying through Co-operatives – Anand Pattern,
National Dairy Development Board,
The Three Phases of Operation Flood,
Technology Mission on Dairy Development,
BAIF Development Research Foundation **8P**

Unit 3 – History of Indian Dairy Products

Introduction to History of Indian Dairy Products
History of Ghee, History of Paneer, History of Curd, History of Buttermilk
History of Khoa & Various sweets. **8P**

Unit 4- Dairy Animal Management.

Introduction to Dairy Animal Management
Breeds of dairy animals in ancient India and their characteristics.
Types & Characteristics of Buffaloes.
Types & Characteristics of Cows. **7P**

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.

Choice Based Credit System Syllabus (2025 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class : S. Y. B. Voc. (Sem-III) **Subject** : Dairy Technology
Course : History of Indian Dairy Development **Course Code** : DRT-209-IKS

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 | PO10 |
| CO1 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 1 |
| CO2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| CO3 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 2 |
| CO5 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 1 |

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.

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.

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.

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.

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 developing 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.

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.

