



Savitribai Phule Pune University

Anekant Education Society's

**TULJARAM CHATURCHAND COLLEGE,  
BARAMATI, DIST-PUNE – 413102**

Syllabus

For

**B. Voc.**

**(Dairy Technology)**

Sponsored by

**University Grant Commission**

Under

**National Skill Qualification Framework  
(NSQF)**

To be implemented from

2022-23

**Title of the Course: B. Voc. (Dairy Technology)**  
**(To be implemented from Academic Year - 2020-2021)**

**Course structure:**

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

**Eligibility:**

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

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

**Examination Pattern:**

**Examination:**

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

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

<b>Sub. Code</b>	<b>Semester-I</b>	<b>Credits</b>	<b>Marks</b>
	<b>Theory (General Education Component)</b>		
UBDT-111	Dairy Development	04	100
UBDT-112	Dairy Farm Management	04	100
UBDT-113	Dairy Chemistry	04	100
	<b>Practical ( Skill component )</b>		
UBDT-111-1	Dairy Farm Management	06	150
UBDT-111-2	Dairy Chemistry	06	150
UBDT-111-3	Soft Skill Development	06	150
	<b>Total</b>	<b>30</b>	<b>750</b>
	<b>Semester-II</b>		
	<b>Theory (General Education Component)</b>		
UBDT-201	Food Preservation Technology	04	100
UBDT-202	Milk Processing Technology	04	100
UBDT-203	Dairy Microbiology	04	100
	<b>Practical ( Skill component )</b>		
UBDT-2.1	Food Preservation Technology	06	150
UBDT-2.2	Dairy Microbiology	06	150
UBDT-2.3	Computer Application	06	150
	<b>Total</b>	<b>30</b>	<b>750</b>
	<b>Total</b>	<b>60</b>	<b>1500</b>
	<b>Year</b>		
<b>Sub. Code</b>	<b>Semester-III</b>	<b>Credits</b>	<b>Marks</b>
	<b>Theory (General Education Component)</b>		
BDT-301	Dairy Processing Equipments	04	100
BDT-302	Fermented Milk Products	04	100
BDT-303	Nutrition Science	04	100
	<b>Practical</b>		
BDT-3.1	Dairy Processing Equipments	06	150
BDT-3.2	Fermented Milk Products	06	150
BDT-3.3	Nutrition Science	06	150
	<b>Total</b>	<b>30</b>	<b>750</b>
	<b>Semester-IV</b>		
BDT-401	Dairy Engineering	04	150
BDT-402	Traditional Indian Dairy Products	04	150
BDT-403	Food Safety, Hygiene & Sanitation	04	150
	<b>Practical (Skill Based Component)</b>		
BDT-4.1	Dairy Engineering	06	150

BDT-4.2	Traditional Indian Dairy Products	06	150
BDT-4.3	Food Safety, Hygiene & Sanitation	06	150
	<b>Total</b>	<b>30</b>	<b>750</b>
	<b>Total Second Year</b>	<b>60</b>	<b>1500</b>
<b>Sub. Code.</b>	<b>Semester-V</b>	<b>Credits</b>	<b>Marks</b>
	<b>Theory (General Education Component)</b>		
BDT-501	Quality Assurance and Waste management	04	100
BDT-502	Fat Rich Milk Products	04	100
BDT-503	Dairy Plant Management	04	100
	<b>Practical (Skill Based Component)</b>		
BDT-5.1	Quality Assurance and Waste management	06	150
BDT-5.2	Fat Rich Milk Products	06	150
BDT-5.3	Project	06	150
	<b>Total</b>	<b>30</b>	<b>750</b>
	<b>Semester-6</b>		
BDT-601	Dairy Product Development	04	100
BDT-602	Packaging Technology	04	100
BDT-603	Entrepreneurship Development	04	100
	<b>Practical (Skill Based Component)</b>		
BDT-6.1	Dairy Product Development	06	150
BDT-6.2	Packaging Technology	06	150
BDT-6.3	In-Plant Training	06	150
	<b>Total</b>	<b>30</b>	<b>750</b>
	<b>Total Final Year</b>	<b>60</b>	<b>1500</b>
	<b>Total for three years</b>	<b>180</b>	<b>4500</b>

Note:

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

## Syllabus (CBCS) For F. Y. B. Voc. Dairy Technology

w. e. from June 2022

Name of the programme	: B. Voc. Dairy Technology
Programme code	: UBDT
Class	: F. Y.
Semester	: I
Course name	: Dairy Development
Course code	: UBDT111
Number of Lecture	: 60

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### Course outcome:

1. Students will understand the fundamentals of the working of a dairy industry
2. They will learn about history of dairy sector in India.
3. They will learn about different schemes run by Indian Government.
4. They will be able to demonstrate clean milk production.
5. They will acquaint with development of a dairy plant.
6. They will learn about animal husbandry practices and Health care.

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<b>B. Voc. First Year</b>	<b>Paper No. UBDT111</b>	<b>Semester I</b>
<b>Dairy Development (Theory-General Education)</b>		

**Maximum Marks: 100**

**Credits: 4**

**Teaching Period: 4/Week**

**Teaching Load: 60 Theory Period/Semester**

### Objective

- To acquaint with properties and role of various constituents in foods, interaction and changes during processing.
- To acquaint with importance of various foods and nutrients in human nutrition.
- To acquaint with different groups of micro-organisms associated with food, their activities, destruction and detection in food.

**Unit-1:Dairy Development and Dairy Co-operatives in India:** History of Dairy Development and Co-operative Society in India, National Dairy Development Board, National Dairy Research Institute, Military dairy farm, IDC, Dairy Co-operatives, Milk Grid, Operation Flood **12 Periods**

**Unit-2:Government Policies and Incentives:** Schemes for Development of Dairying, Assistance to Cooperatives, Intensive Dairy Development Programme (IDDP), Incentive

schemes for Farmers, youth and Entrepreneurs, Dairy/Poultry venture capital fund, Other Schemes for dairying **12 Periods**

**Unit-3:Market Milk:** Definition, Factors affecting composition of milk, Clean milk production, Judging and grading of milk-Organoleptic test, Platform tests, Microbiological examination of Milk , Flavor defects, spoilage of milk their causes and prevention, Uses of milk **12 Periods**

**Unit-4: Animal Husbandry Practices and Health Care:** **12 Periods**  
Introduction to animal husbandry, Digestive system of ruminants and measures of feed energy. Nutrients requirements for growth and milk production, feeding standards, Structure and function of mammary system, Milk secretion and milk let-down. **12 Periods**

**Unit-5: Milk Procurement:** Clean and Hygienic milk production, milk procurement from the rural milk producer and its transportation and modes of payment. **12 Periods**

**References:**

- Dairying in India, Khurody D. N. (1974) Asia Publishing House
- Cooperation Principles and Substance, Gokhale Institute of Politics, New Delhi
- Cooperatives in India, Mathur (1977) Sahitya Bhavan, Agra
- Dairy Management, Pandit Sunder Lal Sharma Institute of vocational guidance 1998

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Name of the programme	: B. Voc. Dairy Technology
Programme code	: UBDT
Class	: F. Y.
Semester	: I
Course name	: Dairy Farm Management
Course code	: UBDT112
Number of Lecture	: 60

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**Course outcome:**

1. Students will have a better understanding of cattle breeds.
2. They will be able to demonstrate different milking techniques.
3. They will be able to define feed , fodder management & its cultivation.
4. They will understand life cycle of dairy animals.
5. They will understand different types of diseases in dairy animals.
6. They can manage a dairy farm as a entrepreneur.

They will get acquainted with the skills for Dairy Farm Management

**B. Voc. First Year** **Paper No. UBDT112** **Semester I**  
**Dairy Farm Management (Theory-General Education)**

**Maximum Marks: 100**

**Credits: 4**

**Teaching Period: 4/Week**

**Teaching Load: 60 Theory Period/Semester**

**Objectives-**

- To know the need and importance of dairy farm.

- To study the milking techniques, feed management and farm waste management

**Unit-1: Introduction to dairy farm management:** Dairy farm management-introduction, definition, principles, skills in Dairy farming, future scope of dairy management, constraints in dairy farming. Concept of entrepreneurship; entrepreneurial and managerial characteristics; managing an enterprise; motivation and entrepreneurship development; importance of planning, monitoring, evaluation and follow up; SWOT analysis of Dairy

**12 Periods**

**Unit-2: Dairy Farm Management Practices:** Introduction to Milking Techniques: Types of milking techniques-Hand and Machine, steps of milking, milking management, testing of machines, maintenances of machines, cleaning routine of machine in parlour. Identification of animals, Weighing of cattle, Determination of age, Restraining & Casting of Animals, Castration, Grooming, Body condition scoring, Drying off, Culling, Vaccination, Deworming, Record keeping, Carcass disposal

**12 Periods**

**Unit-3: Feed Management:** Basics of ruminant nutrition & digestion, Nutrient requirement, Rumination, Components of dairy feed- water, forages, concentrates, By products, Basic principles of feed and fodder management, feed mixing, feeding management, cultivation of forage and storage, Hay making, Silage Production, Housing of dairy animals- objectives of housing, Systems of housing, components of the animal house

**12 Periods**

**Unit-4: Cattle Breed:** Distinguishing characteristics of India and exotic breeds of dairy animals and their performance. Systems of breeding and methods of selection of dairy animals, Life cycle of Dairy animals, factors affecting dairy herd production & health

**12 Periods**

**Unit-5: Diseases in Dairy animals :** Common disease problem in dairy animals, their prevention and controls- Foot & mouth disease, Foot rot, Hemorrhagic septicemia(HS), Black Quarter( BQ), Brucellosis, Anthrax, John's disease, Bovine tuberculosis, Mycotoxicosis, Ephemeral fever, Dermatophytosis, Dermatophilosis, mastitis & diseases of teats, Tick & fly borne disease, common nutrition disorders in Dairy cows-Rumen acidosis, urea poisoning, Bloat, Ketosis, milk fever.

**12 Periods**

#### 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 (2002)

Name of the programme	: B. Voc. Dairy Technology
Programme code	: UBDT
Class	: F. Y.
Semester	: I
Course name	: Dairy Chemistry
Course code	: UBDT113
Number of Lecture	: 60

Course outcome:

1. Students will understand the chemical make-up of the milk.
2. They will know about the different aspects of clean milk production,
3. They will be able to assess composition of milk.
4. They will acquaint with the properties of milk.
5. They can explain the crucial parameters of the milk.
6. They will understand the nutritive value that milk holds.

**B. Voc. First Year**

**Paper No. UBDT113**

**Semester I**

**Dairy Chemistry (Theory-General Education)**

**Maximum Marks: 100**

**Credits: 4**

**Teaching Period: 4/Week**

**Teaching Load: 60 Theory Period/Semester**

**Objectives-**

- To understand the chemistry of milk and its products, composition, role of each component and their interactions.
- To understand preservatives and processing of milk.
- To study the adulteration in milk and milk products

**Unit-1:Introduction to dairy chemistry:** Definition and structure of milk, factors affecting composition of milk, Physico-chemical properties of milk Nutritive value of milk, colostrum, Coagulation of Milk with Heat, acid, enzymes and alcohol.

**12 Periods**

**Unit-2:Proteins:** Nomenclature and classification of milk proteins, casein,  $\alpha$ -Lactalbumin and  $\beta$  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.

**12 Periods**

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

**12 Periods**

**Unit-4:Lipids:** Definition, general composition and classification of milk lipids. Nomenclature and general structure of glycerides, Structure of FG, Chemistry of FGM, factors affecting the fatty acid composition. Milk phospholipids and their role in milk products, Rancidity and its control

**12 Periods**

**Unit 5:Vitamins and Minerals:** Unsaponifiable matter and fat soluble vitamins, Milk Salts: Mineral in milk (a) major mineral (b) Trace elements, physical equilibria among the milk salts and Milk contact surfaces and metallic contamination.

**12 Periods**

**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

Name of the programme : B. Voc. Dairy Technology



Programme code : UBDT  
Class : F. Y.  
Semester : I  
Course name : Dairy Farm Management  
Course code : UBDT111-1  
Number of Lecture : 90

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Course outcome:

1. Students will be able to examine quality of milk.
2. They will learn about different adulterants.
3. They will be able to demonstrate adulteration tests for the milk.
4. They will be able to apply hygienic practices in the dairy farm.
5. They will know about anatomy of milking animals.

**B. Voc. First Year Paper No. UBDT111-1 Semester I**  
**Dairy Farm Management (Practical-Skill Component)**

**Maximum Marks: 150**

**Credits: 6**

**Teaching Period: 2/Week**

**Teaching Load: 24 practical/Semester (4 Period each)**

**Objectives:**

- To know the need and importance of dairy farm.
- To study common practices carried out at a dairy farm.
  1. Identification of different milk breeds of cattle, buffalo, and external anatomy, mammary system of dairy animals 2P
  2. Housing of animals and maintenance of hygienic conditions at farm 2P
  3. Clean milk production 3P
  4. Detection of starch in milk 1P
  5. Detection of cane sugar in milk 2P
  6. Detection of Glucose in milk 2P
  7. Detection of Urea in milk 2P
  8. Detection of Ammonium sulphate in milk 2P
  9. Detection of Sodium carbonate or bicarbonate as a neutralizer in milk 2P
  10. Standardization of Milk 2P
  11. Microbiological examination of milk- SPC, MBRT, phosphatase test 2P
  12. Field or farm visit 2P
  13. Activity – Visit to farm (Identification of feed and fodder, their report, photograph collection on farm visit)

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Name of the programme : B. Voc. Dairy Technology  
Programme code : UBDT  
Class : F. Y.  
Semester : I





- 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)