

**D R. BABASAHEB AMBEDKAR  
MARATHWADA UNIVERSITY,  
AURANGABAD.**



Revised Syllabus of  
B.Sc. [Dairy Science & Technology]  
Semester – I & II  
(With Credit System)

*( Effective from 2009-10 & onwards )*

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
**B.Sc. Dairy Science and Technology (Optional) Pattern in**  
**Semester System**  
**B.Sc. First Year**

Semester	Course code	Paper number	Title of paper	Credits	Marks
I	DST-101	Paper-I	Dairy Farm Management	03	50
	DST-102	Paper-II	Market Milk Industry	03	50
	DST-103	Paper-III	Practical Based On Paper-I	1.5	50
	DST-104	Paper-IV	Practical Based On Paper-II	1.5	50
II	DST-201	Paper-V	Live Stock health and Hygiene	03	50
	DST-202	Paper-VI	Dairy Processing & Engineering	03	50
	DST-203	Paper-VII	Practical Based On Paper-V	1.5	50
	DST-204	Paper-VIII	Practical Based On Paper-VI	1.5	50

**B.Sc. Second Year**

Semester	Course code	Paper number	Title of paper	Credits	Marks
III	DST-301	Paper-IX	Animal Nutrition	03	50
	DST-302	Paper-X	Indian Dairy Products	03	50
	DST-303	Paper-XI	Practical Based On Paper-VIII	1.5	50
	DST-304	Paper-XII	Practical Based On Paper-IX	1.5	50
IV	DST-401	Paper-XIII	Feed Processing	03	50
	DST-402	Paper-XIV	Cheese and Fermented Milk Products	03	50
	DST-403	Paper-XV	Practical Based On Paper-XIII	1.5	50
	DST-404	Paper-XVI	Practical Based On Paper-XIV	1.5	50

**B.Sc. Third Year**

Semester	Course code	Paper number	Title of paper	Credits	Marks
V	DST-501	Paper-XVII	Animal Reproduction and A.I.	03	50
	DST-502	Paper-XVIII	Ice-Cream and fat rich dairy products	03	50
	DST-503	Paper-XIX	Practical Based On Paper-XVII	1.5	50
	DST-504	Paper-XX	Practical Based On Paper-XVIII	1.5	50
VI	DST-601	Paper-XXI	Genetics and Breeding	03	50
	DST-602	Paper-XXII	Condensed dried milks and by products	03	50
	DST-603	Paper-XXIII	Practical Based On Paper-XXI	1.5	50
	DST-604	Paper-XIV	Practical Based On Paper-XXIII	1.5	50

**Note: For Theory Paper, 1 Credit = 15 Periods**  
**For Practical Paper, 1 Credit = 30 periods**

## Dairy Science & Technology

### Structure of the B.Sc. I, II & III year Course

Sr. No.	Class	Semester	Paper No	Title of the Paper	Credits
1.	B.Sc. I	I	Paper I	Dairy Farm Management	03
			Paper II	Market Milk Industry	03
			Paper III	Practical	1.5
			Paper IV	Practical	1.5
		II	Paper V	Live Stock health and Hygiene	03
			Paper VI	Dairy Processing & Engineering	03
			Paper VII	Practical	1.5
			Paper VIII	Practical	1.5
2.	B.Sc. II	III	Paper IX	Animal Nutrition	03
			Paper X	Indian Dairy Products	03
			Paper XI	Practical	1.5
			Paper XII	Practical	1.5
		IV	Paper XIII	Feed Processing	03
			Paper XIV	Cheese and Fermented Milk Products	03
			Paper XV	Practical	1.5
			Paper XVI	Practical	1.5
3.	B.Sc. III	V	Paper XVII	Animal Reproduction and A.I.	03
			Paper XVIII	Ice-Cream and fat rich dairy products	03
			Paper XIX	Practical	1.5
			Paper XX	Practical	1.5
		VI	Paper XXI	Genetics and Breeding	03
			Paper XXII	Condensed dried milks and by products	03
			Paper XXIII	Practical	1.5
			Paper XXIV	Practical	1.5

B.Sc. First Year  
(Dairy Science Technology)  
Semester I & II

Objectives

The course is planned to acquaint the students with :

- i) Farming aspects in livestock so as to prepare themselves for future prospectus.
- ii) Role of Dairying in national economy.
- iii) Sanitary and hygienic conditions in Animal farm.
- iv) Establishment of Dairy farm
- v) Various Drug Therapies.
- vi) Study of various diseases & disorders in livestock.
- vii) Processing of market milk in dairy plant.
- viii) Dairy Engineering inputs to dairy plant.
- ix) Dairy Chemistry applicable to market milk.
- x) Dairy Microbiology considerations to market milk.

B.Sc. I Year (Semester – I)  
Dairy Science & Technology  
Paper-I  
Title: Dairy Farm Management

Max. Marks – 50

Sr. No.	Topics	No. of Periods
1.	Role of Livestock in national economy	03
2.	Management: i) Principles of Management ii) Tools of Management iii) Tools of Management	05
3.	General Management Practices in Dairy Farming i) Grooming ii) Drying Off iii) Control of bad habits iv) Castration v) Dehorning vi) Trimming vii) Shoeing viii) Identification marks ix) Removing extra teats x) Shearing	06
4.	Cattle and Buffalo Management i) Housing of Cattle & Buffalo ii) Calf Management iii) Heifer Management iv) Management of Pregnant and Lactating Cow & Buffalo v) Care and Management of Cross – breed Cows vi) Care and Management of Breeding buffalo.	20

5.	Sheep and Goat Management i) Housing of Sheep & Goat ii) General Management Practices	06
6.	Poultry Management i) Housing of Poultry ii) General Management Practices	06
Total		46

B.Sc. I Year (Semester – I)  
Dairy Science & Technology  
Paper-II  
Title: Market Milk Industry

Sr. No.	Topics	No. of Periods
1.	Dairy Development in India. NDDDB, NDRI, Military dairy farm, IDC, Dairy Co-operatives, Milk Grid, Operation Flood.	06
2.	Milk Chemistry and Constituents i) Definition and Composition of milk. ii) Constituent of Milk iii) Factors affecting quality and quantity of milk. iv) Nutritive value of milk v) Physico – Chemical properties of milk.	15
3.	Anatomy and Physiology of mammary gland. i) Morphology and anatomy of udder. ii) Physiology of Milk secretion. iii) Milk Precursors iv) Endocrinology of milk secretion.	05
4.	Microbiology of milk. i) Definition and classification of micro organism. ii) Reproduction and growth of microorganism. iii) Common micro-organism found in milk. iv) Spoilage of milk v) Fermentation of milk – desirable and undesirable. vi) Clean milk production, sources of contamination. vii) Milk borne diseases	15

5.	Metals and Non-metals using in dairy industry	02
6.	Legal Standard	01
7.	Adulteration of Milk	02
8.	Packaging and Packaging material	02
	Total	48



B.Sc. I Year (Semester – I)  
Dairy Science & Technology  
Paper-III  
Practicals (Dairy Form Management)

Sr. No.	Topics	No. of Periods
1.	Morphology of Cattle, buffalo and poultry	01
2.	Classification of Cattle Breeds	01
3.	Study of Cattle Breeds i) Milch : Gir, Sahiwal, Red Sindhi ii) Draught : Khillar, Dangi, Red Kandhari iii) Dual : Deoni, Hariyana iv) Exotic : Jersey, H.F. v) Cross breed : Holdeo, Jerdeo	03
4.	Study of buffalo breeds : Murratia, Jaffrabadi, Nagpuri, Surti	01
5.	Study of Goat breeds : Osmanabadi, Saqnen	01
6.	Identification marks of form animals	01
7.	Casting of form animals	01
8.	Milking of Dairy animals	01
9.	Ageing of dairy cattle	01
10.	Weighing of dairy cattle	01
11.	Trimming of dairy cattle	01
12.	Shoeing of bullocks	01
13.	Visit to modern dairy farm	01
Total		15

B.Sc. I Year (Semester – I)  
Dairy Science & Technology  
Paper-IV  
Practical : (Market Milk Industry)

Sr. No.	Topics	No. of Periods
1.	Study of Structure of Udder on model	01
2.	Study of steps for clean and safe milk production	01
3.	Sampling techniques of milk for physico – chemical test.	01
4.	Platform test. i) Organoleptic test ii) Temperature iii) C.O.B. test iv) Alcohol test v) Sediment test	02
5.	Determination specific gravity of milk	01
6.	Determination of fat test of milk	01
7.	Determination of SNF and TS of milk	01
8.	Determination of Acidity and PH of milk	01
9.	Staining of bacteria	01
10.	Methylene blue reduction (MBR) test	01
11.	Standard plate count (SPC) of milk	02
12.	Detection of Adulterants and preservatives in milk	02
13.	Collection and identification of packaging material.	01
14.	Visit to collection centre	
	total	16

B.Sc. I Year (Semester – II)  
Dairy Science & Technology  
Paper-V  
Title: Livestock Healthy and Hygiene

Sr.No.	Topics	No. of Periods
1.	Identification of healthy and sick animals	01
2.	Classification of animal diseases	02
3.	Study of major diseases i)Foot and mouth disease (FMD) ii)Rinder pest (RP) iii)Anthrax iv)Black quarters (BQ) v)Heamorrhagic Septicaemia (H.S.)	10
4.	Diseases of Parasitic diseases i) Brucellosis ii) Babesiasis iii) Theteriosis iv) Trichomoniasis v) Trypanosomiasis	08
5	Diseaseof Lactating cow : i) Mastitis ii) Dystokia iii) Milk fever iv) Prolaps v) Ketosis	06
6.	Diseases of Carves i) Pneumonia ii) Calf Score iii) Diarrhoea	04
7.	Poultry Disease i) Raniknet ii) Coccidiosis iii) Fowlpox iv) Gumboro v) Parasites of poultry	09

8.	First aid measures	03
9.	Disposal of carcass	02
	Total	46

B.Sc. I Year (Semester – II)  
Dairy Science & Technology  
Paper-VI

Title: Dairy Processing and Engineering

Sr.No.	Topics	No. of Periods
1.	Dairy Processing i) Milk collection, transportation, Grading, weighing and cooling of milk ii) Strainer and Straining of milk iii) Filter and Filtration of milk iv) Clarifier and clarification of milk v) Cream separator and separation vi) Standardization vii) Pasteurization History, formulation standards types, FDV, Regeneration efficiency viii) Homogenization Single & double stage homogenization, theory of homogenization, Homogenizer valve, homogenization efficiency ix) Sterilization Bottle, UHT, aseptic packaging	20
II	Special Milks : 1) Flavored Milk 2) Toned & double toned milk 3) Recombined & Reconstituted milk 4) Sterilized milk 5) Imitation milk	05

III	<p>Dairy Engineering</p> <p>i) Cleaning &amp; Sanitation : Cleaning agents, CIP &amp; COP</p> <p>ii) Working &amp; maintenance of can washer, crate washer and bottle washer</p> <p>iii) Sanitary milk pump &amp; fittings, types of pumps</p> <p>iv) Boiler : Properties of steam, steam generation, types of boiler.</p> <p>v) Refrigeration : Vapor compression refrigeration cycle, common refrigerants, properties of good refrigerants.</p> <p>vi) Dairy Plant layout : Selection of site, layout of liquid and composite milk plant.</p> <p>vii) Cold Storage : Types of cold storages, types of loads.</p>	20
	Total	45

B.Sc. I Year (Semester – II)  
Dairy Science & Technology  
Paper-VII  
Practical: (Livestock Health & Hygiene)

Sr.No.	Topics	No. of Periods
1.	Identification of healthy animals	01
2.	Identification of sick animals	01
3	Recording the temperature of farm animals	01
4	Recording pulse and respiration rate of farm animals	01
5	Preparation of antiseptic ointments	01
6.	Preparation of Astringents	01
7.	Study of injections	01
8.	Preparation of Vaccination schedule	01
9.	Dressing of common wounds	01
10.	Mastitis tests	01
11.	Pathological tests, urine, blood.	01
12.	Identification & control of ecto and endoparasites in farm animals.	02
13.	Study of dairy farm records.	01
14.	Study of common appliances used in animal treatment.	01
15.	Visit to veterinary polyclinic	01
	Total	16

B.Sc. I Year (Semester – II)  
Dairy Science & Technology  
Paper-VIII  
Practical: (Dairy Processing & Engineering)

Sr. no.	Topics	No.of periods
1.	Study of milk collection equipment	01
2.	Study of filter, strainer, clarifier	01
3.	Study of cream separator	01
4.	Preparation of standardized milk	01
5.	Study of Autoclave	01
6.	Preparation of sterilized milk.	01
7.	Study of Can washer, Crate Washer and Bottle Washer.	01
8.	Study of Boiler	01
9.	Study of Household refrigerator	01
10.	Layout of milk processing / Chilling Center	01
11.	Preparation of flavoured milk.	01
12.	Preparation of toned milk	01
13.	Preparation of Imitation milk.	01
14.	Dairy arithmetics : (a) Standardization (b) Efficiency of regeneration in pasteurizer. (c) Efficiency of Cream separation / creaming efficiency	02
15.	Visit to Dairy processing plant / Chilling Center.	01
	Total	16



## **Dairy Science & Technology**

### **Reference Books**

- 1] A Text book of Animal Husbandry by - G.C. Banarjee
- 2] A Text Book of Animal Science by - Dr. A.U. Bhikane and Dr. S.B. Kawitkar
- 3] Advances of animal Husbandry, The I.C.A.R. publication.
- 4] Animal Husbandry & Dairy Science by. Jagdish Prasad.
- 5] Dairy India Year Book – 2007 by - P.R. Gupta
- 6] Handbook of Veterinary Physician by V.A. Sarpe
- 7] Farm Animal Management and feeding practices in India by Thomas of Shashtri.
- 8] Outlines of Dairy Technology by Sukumar De.
- 9] Dairy Processing by Earl.
- 10] Dairy Technology and Engineering by H.G. Kessler
- 11] Dairy Plant Engineering and Management by Tuffel Ahmed.
- 12] Textbook of Dairy Plant Layout & Design by Lalat Chander, I.C.A.R. publication.
- 13] Principles of Dairy Chemistry by Jenners and Pattorn.
- 14] Dairy Chemistry by M.M. Rai.
- 15] Dairy Microbiology by K.C. Mahanta.