॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक २७ मे २०२५ रोजी संपन्न झालेल्या मा. विद्यापरिषद बैठकीतील विषय क्रमांक १६/६१–२०२५ च्या ठरावानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरण–२०२० नुसारचे पदवी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यास मा. विद्यापरिषदेने मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील बी. एस्सी द्वितीय वर्षाचे खालील विषयाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यात येत आहेत.

01	B.Sc. Agriculture Microbiology	11	B.Sc. Physics
02	B.Sc. Botany	12	B.Sc. Seed Technology
03	B.Sc. Dairy Science	13	B.Sc. Horticulture
04	B.Sc. Electronics	14	B.Sc. Statistics
05	B.Sc. Environmental Science	15	B.Sc. Biochemistry
06	B.Sc. Fishery Science	16	B.Sc. Analytical Chemistry
07	B.Sc. Food Science	17	B.Sc. Agrochemical & Fertilizers
08	B.Sc. Geology	18	B.Sc. Industrial Chemistry
09	B.Sc./B.A. Mathematics	19	B.Sc. Industrial Microbiology
10	B.Sc. Microbiology		

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२५–२६/११६
दिनांक ०५.०६.२०२५

सहाय्यक कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत : माहितीस्तव तथा कार्यवाहीस्तव.
१) मा. कुलगुरू महोदयांचे कार्यलय, प्रस्तुत विद्यापीठ.
२) मा. प्र. कुलगुरू महोदयांचे कार्यलय, प्रस्तुत विद्यापीठ.
३) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
४) मा. संचालक, परीक्षा व मुंल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
५) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, परिपत्रक अभ्यासक्रम संकेतस्थळावर प्रसिध्द करण्यात यावेत.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY

NANDED-431606

B.Sc. S.Y.

Subject: DAIRY SCIENCE

(Affiliated College)

Under the Faculty of Science & Technology

Effective from Academic Year 2025-26

(As per NEP-2020)

From the Desk of the Dean, Faculty of Science and Technology,

Swami Ramanand Teerth Marathwada University, Nanded, enduring to its vision statement "***Enlightened Student: A Source of Immense Power***", is trying hard consistently to enrich the quality of science education in its jurisdiction by implementing several quality initiatives. Revision and updating curriculum to meet the standard of the courses at national and international level, implementing innovative methods of teaching-learning, improvisation in the examination and evaluation processes are some of the important measures that enabled the University to achieve ***the 3Es, the equity, the efficiency*** and ***the excellence*** in higher education of this region. To overcome the difficulty of comparing the performances of the graduating students and also to provide mobility to them to join other institutions the University has adopted the cumulative grade point average (CGPA) system in the year 2014-2015. Further, following the suggestions by the UGC and looking at the better employability, entrepreneurship possibilities and to enhance the latent skills of the stakeholders the University has adopted the Choice Based Credit System (CBCS) in the year 2018-2019 at graduate and post-graduate level. This provided flexibility to the students to choose courses of their own interests. To encourage the students to opt the world-class courses offered on the online platforms like, NPTEL, SWAYM, and other MOOCS platforms the University has implemented the credit transfer policy approved by its Academic Council and also has made a provision of reimbursing registration fees of the successful students completing such courses.

SRTM University has been producing a good number of high calibre graduates; however, it is necessary to ensure that our aspiring students are able to pursue the right education. Like the engineering students, the youngsters pursuing science education need to be equipped and trained as per the requirements of the R&D institutes and industries. This would become possible only when the students undergo studies with an updated and evolving curriculum to match global scenario.

Higher education is a dynamic process and in the present era the stakeholders need to be educated and trained in view of the self-employment and self-sustaining skills like start-ups. Revision of the curriculum alone is not the measure for bringing reforms in the higher education, but invite several other initiatives. Establishing industry-institute linkages and initiating internship, on job training for the graduates in reputed industries are some of the important steps that the University would like to take in the coming time. As a result, revision of the curriculum was the need of the hour and such an opportunity was provided by the New Education Policy 2020. National Education Policy 2020 (NEP 2020) aims at equipping students with knowledge, skills, values, leadership qualities and initiates them for lifelong learning. As a result the students will acquire expertise in specialized areas of interest, kindle their intellectual curiosity and scientific temper, and create imaginative individuals.

The curriculum given in this document has been developed following the guidelines of NEP-2020 and is crucial as well as challenging due to the reason that it is a transition from general science based to the discipline-specific-based curriculum. All the recommendations of the ***Sukanu Samiti*** given in the **NEP Curriculum Framework-2023** have been followed, keeping the disciplinary

approach with rigor and depth, appropriate to the comprehension level of learners. All the Board of Studies (BoS) under the Faculty of Science and Technology of this university have put in their tremendous efforts in making this curriculum of international standard. They have taken care of maintaining logical sequencing of the subject matter with proper placement of concepts with their linkages for better understanding of the students. We take this opportunity to congratulate the Chairman(s) and all the members of various Boards of Studies for their immense contributions in preparing the revised curriculum for the benefits of the stakeholders in line with the guidelines of the **Government of Maharashtra regarding NEP-2020**. We also acknowledge the suggestions and contributions of the academic and industry experts of various disciplines.

We are sure that the adoption of the revised curriculum will be advantageous for the students to enhance their skills and employability. Introduction of the mandatory ***On Job Training, Internship program*** for science background students is praise worthy and certainly help the students to imbibe firsthand work experience, team work management. These initiatives will also help the students to inculcate the workmanship spirit and explore the possibilities of setting up of their own enterprises.

Dr. M. K. Patil
Dean
Faculty of Science and Technology
Swami Ramanand Teerth Marathwada University,
Nanded

From the Desk of the Chairman, Board of Studies of the Dairy Science

Preamble:

The emergence Dairy Science of many centuries ago is considered one of the most important scientific achievements. Since then, it has become a leading field in the Dairy Science, Food Industry and a popular course of study in higher institutions worldwide. Like every other B.Sc. programme in tertiary education, B.Sc. Dairy Science has its own set of different syllabi, which students must cover before they are allowed to graduate. The New Education policy presents an opportunity to shift paradigm from a teacher – centric to student centric higher education system in India. It caters for skill-based education. The learning outcomes- based curriculum framework for M. Sc. Dairy Science is intended to provide a comprehensive foundation to the subject and to help students develop the ability to successfully continue with further studies and research in the subject while they are equipped with required skills at various stages. Efforts .has been made to integrate use of recent technology in teaching and learning. The syllabus is designed to equip students with valuable cognitive abilities and skills so that they are successful in meeting diverse needs of professional careers in a developing and knowledge-based society. The curriculum considers the need to maintain globally competitive standards of achievement in terms of knowledge and skills in Dairy Science, Animal Husbandry, Animal Nutrition, Milk production and procurement and technical concept as well as develop scientific orientation, problem solving skills, human and professional values which foster rational and critical thinking in the students. This course serves a good opportunity in different fields in Dairy Science and Dairy Industry. By the end of the program, students will be able to:

- Understanding biochemical and physiological aspects of Dairy Products and developing Techniques
- perspective to identify innovative solutions for Two Year PG Credit Framework of Sci. & Tech. Faculty of S.R.T.M.U. Nanded

Dr. Rajkumar Sopanrao Sonawane
Shri. Sharda Bhavan Education Society's
Yeshwant Mahavidyalaya, Nanded
Chairman
Board of Studies of the DAIRY SCIENCE
Swami Ramanand Teerth Marathwada University, Nanded.

Dr. PandurangTukaram Gangasagare
Adarsh Education Society's Arts, Commerce and Science College, Hingoli
Former Chairman
Board of Studies of the DAIRY SCIENCE
Swami Ramanand Teerth Marathwada University, Nanded.

Members of the Board of Studies in the subject of DAIRY SCIENCE under the faculty of Science and Technology

Sr. No.	Name of the Member	Designation	Address	Contact No.
1	Dr. S. N. Landge	Professor	Maharashtra Udayagiri Mahavidyalaya Udgir.	9673761858
2	Dr. P.T. Gangasagare	Professor	Adarsh Mahavidyalaya, Hingoli	9822575427
2	Dr. V. V. Niras	Professor	Vivakenand Mahavidyalaya Aurangabad	9422712087
3	Dr. G. K. Londhe	Professor	College of Agricultural Parbhani	9421449497
5	Dr. S.M. Gaikwad (Invited Nominee)	Asst. Professor	Sanjeevanee Mahavidyalaya, Chapoli	9673722333

Objectives of the course

The course is fore thought to acquaint the student's with

- Know farming aspects in livestock so as to prepare themselves for future prospects.
- Learner can know appreciate geographical distribution and trends in livestock population growth
- Student's can understand the roles of livestock in National economic of their socio-economic aspects.
- Understand the sanitary and hygienic condition in Animal Farm.
- Student's can understand the nature and quality of ration required to the livestock.
- Student's can understand the adaptations and livestock farming in India.
- Sanitary and hygienic conditions in livestock farm.
- Learner can under stand the Establishment of livestock farming.
- Student's can know the Care and management of farm livestock.
- Student's can understand the physiology of lactation

Outcomes of the course

After completing one can work as a livestock supervisor in a various well established dairy farm and animal breeding farm.

- One can work as a Dairy Farm manager.
- Understanding concept of cattle and buffalo breeding.
- Understanding concept of conservation of Animal Genetic Resources.
- Job opportunities as wage employment in Livestock assistant / Dairy farm assistant / Farm supervisor / Farm assistant.
- Self-Employment as Dairy farm owner / Fodder producer / Cattle feed.
- To prepare young and enthusiastic entrepreneur for self-employment through dairying and dairy associated activities.
- Job opportunities in milk processing plant / Milk products manufacturing unit.
- One can work as manager in Dairy plant.
- Job opportunities in quality control in manufacturing unit.

2 (5.0)	III	Major 1(T-2cr) Major 2(T-2cr) Major 3(P-2cr) Major 4(P-2cr) 8 Cr	Minor 1 (T-2cr) Minor 2 (P-2cr) 4Cr	—	GE 3 2Credits	VSC 1 2Credits	ACEENG3 (2Cr) ACEMIL3 (2Cr) 4Credits	CCC(2Cr) *(NCC/NSS/SPT/ CLS/ HWS/YGE/FIT)* 2Credits	22	88
	IV	Major 5(T-2cr) Major 6(T-2cr) Major 7(P-2cr) Major 8(P-2cr) 8 Cr	Minor 1 (T-2cr) Minor 2 (P-2cr) 4 Cr	—	GE 4 2Credits	VSC 2 2Credits	ACEENG4 (2Cr) ACEMIL4 (2Cr) EVS (2Cr) 6Credits	---	22	
	Cr	24	16	08	08	08	22	02	88	
Exit option: UG Diploma in Major and Minor on completion of 88 credits and additional 4 credits NSQF/ Internship in Major Subject										

B.Sc. Second Year Semester III *(Level 5.0)*

Teaching Scheme

Subject	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/week)	
			Theory	Practical	Total	Theory	Practical
Major	SDRSCT1201	Principles of Animal Nutrition (1201)	02	--	**04**	02	--
Major Practical	SDRSCP1202	Practical Paper (1202) Based on theory Paper 1201	-	02			04
Major	SDRSCT1203	Dairy Farm Management (1203)	02	--	**04**	02	--
Major Practical	SDRSCP1204	Practical Paper (1204) Based on theory Paper 1203	-	02			04
Minor	SDRSCM1205	Milk Hygiene & Public Health (1205)	02	--	**04**	02	--
Minor Practical	SDRSMP1206	Practical Paper (1206) Based on theory Paper 1205	-	02			04
Generic Electives	SDRSGE1207	Poultry Farming	02	--	**02**	02	--
Skill Based Course	SDRSSC1208	Technology of Indigenous Dairy Products (1208)	--	02	**02**	--	04
Ability Enhancement Course	AECENG1209	Compulsory English	02	--	**02**	02	--
Ability Enhancement Course	**ACEMIL1210**	(Mar / Hin / Urd / Kan / Pal)	02	--	**02**	02	--
CCC	**NSS/SPT/CLS/ HWS/YGE/1211**	**---**	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B.Sc. Second Year Semester III *(Level 5.0)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

Subject	Course Code	Course Name	Theory				Practical		Total
			Continuous Assessment(CA)			ESA			
			Test I	Test II	Average of T1 & T2	Total	CA	ESA	
Major	SDRSCT1201	Principles of Animal Nutrition (1201)	10	10	10	40	--	--	50
Major Practical	SDRSCP1202	Practical Paper (1202) Based on theory Paper 1201	--	--	--	--	20	30	50
Major	SDRSCT1203	Dairy Farm Management (1203)	10	10	10	40	--	--	50
Major Practical	SDRSCP1204	Practical Paper (1204) Based on theory Paper 1203	--	--	--	--	20	30	50
Minor	SDRSCM1205	Milk Hygiene & Public Health(1205)	10	10	10	40	--	--	50
Minor Practical	SDRSMP1206	Practical paper (1206) Based on theory paper 1205	--	--	--	--	20	30	50
Generic Elective	SDRSGE2507 (G4)	Poultry Farming	10	10	10	40	--	--	50
Skill Based Course	SDRSSC1208 (VSC4)	Technology of Indigenous Dairy Products (1208)	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1209	Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	**ACEMIL1210**	(Mar / Hin / Urd / Kan / Pal)	10	10	10	40	--	--	50
CCC	**NCC/NSS/SP/CLS/HWS/YGE/1211**	----	10	10	10	40	--	--	50

B.Sc. Second Year Semester IV *(Level 5.0)*

Teaching Scheme

Subject	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/week)	
			Theory	Practical	Total	Theory	Practical
Major	SDRSCT1251	Artificial Insemination & Reproduction in Livestock (1251)	02	--	**04**	02	--
Major Practical	SDRSCP1252	Practical Paper (1252) Based on theory paper 1251	-	02			04
Major	SDRSCT1253	Technology of Western Dairy Products (1253)	02	--	**04**	02	--
Major Practical	SDRSCP1254	Practical Paper (1254) Based on theory paper 1253	-	02			04
Minor	SDRSCM1255	Farm Animal Health Management (1255)	02	--	**04**	02	--
Minor Practical	SDRSMP1256	Practical paper (1256) Based on theory paper 1255	-	02			04
Generic Electives	SDRSGE1257	Goat Farming (1257) GE4	02	--	**02**	02	--
Skill Based Course	SDRSSC1258	Dairy By- Products (1258)	--	02	**02**	--	04
Ability Enhancement Course	AECENG1259	Compulsory English	02	--	**02**	02	--
Ability Enhancement Course	**ACEMIL1260**	(Mar / Hin / Urd / Kan / Pal)	02		**02**	02	
EVS	Environmental Study 1261	**----**	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B.Sc. Second Year Semester IV *(Level 5.0)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

Subject	Course Code	Course Name	Theory				Practical		Total
			Continuous Assessment (CA)			ESA			
			Test I	Test II	Average of T1 & T2	Total	CA	ESA	
Major	SDRSCT1251	Artificial Insemination & Reproduction in Livestock (1251)	10	10	10	40	--	--	50
Major Practical	SDRSCT1252	Practical paper (1252) Based on theory paper 1251	--	--	--	--	20	30	50
Major	SDRSCP1253	Technology of Western Dairy Products(1253)	10	10	10	40	--	--	50
Major Practical	SDRSCP1254	Practical paper (1254) Based on theory paper 1253	--	--	--	--	20	30	50
Minor	SDRSCM1255	Farm Animal Health Management (1255)	10	10	10	40	--	--	50
Minor Practical	SDRSMP1256	Practical paper (1256) Based on theory paper 1255	--	--	--	--	20	30	50
Generic Elective	SDRSGE1257 (G3)	Goat Farming (1257) GE4	10	10	10	40	--	--	50
Skill Based Course	SDRSSC1258 (VSC2)	Dairy By- Products (1258)	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1259	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	ACEMIL1260	(MAR/HIN/URD/KAN/PAL)	10	10	10	40	--	--	50
EVS	Environmental Study 1211	**----**	10	10	10	40	--	--	50

Swami Ramanand Teerth Marathwada University, Nanded

NEP-2020 (Pattern)

DAIRY SCIENCE

B. Sc. Second Year (Semester-III)

Name of Paper :- Principles of Animal Nutrition (Major)

Theory	Subject Code: SDRSCT-1201
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite:-

The prerequisites for an Animal Nutrition course students are expected to have a foundational understanding of biological and agricultural sciences.

- Understanding of macronutrient and micronutrient metabolism, enzymatic reactions, and energy production.
- Knowledge of the digestive, endocrine, and metabolic systems of animals.

Course Objectives:

- Introduce the fundamental concepts of animal nutrition, including nutrient requirements and metabolism.
- Explain the classification, digestion, absorption, and utilization of nutrients in animals.
- Discuss the nutritional needs of different animal species at various growth stages and production levels.

Course Outcomes:

Upon successful completion of the course, students will be able to:

- Explain the role of carbohydrates, proteins, fats, vitamins, minerals, and water in animal diets.
- Compare and contrast the digestive systems of monogastric, ruminant, and non-ruminant species.
- Develop appropriate rations to meet the nutritional requirements of various animal species.

B. Sc. Second Year (Semester-III)

Principles of Animal Nutrition (Major) SDRSCT-1201

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
1.0		**Fundamentals of Animal Nutrition**	**08**
	1.1	Definition and Importance of Animal Nutrition	
	1.2	Nutrients: Classification and Role in Animal Body	
	1.3	Nutritional Importance of Minerals and Vitamins Sources, Deficiency Symptoms, and Requirements	
	1.4	Digestive System of Ruminants, Digestive system of poultry	
2.0		**Digestion, Absorption, and Metabolism of Nutrients**	**07**
	2.1	Digestion, and Absorption, of Carbohydrates, Proteins, and Lipids in Ruminants	
	2.2	Feedstuffs: Classification and Nutritive Value	
	2.3	Rationing of Animals: Balanced, Maintenance, and Production	
3.0		**Practical Aspects of Animal Feeding**	**07**
	3.1	Study of Digestibility and Factors: definition, digestibility coefficient factors affecting it.	
	3.2	Feeding Practices for Milking buffalo	
	3.3	Methods of Feed Processing: physical, biological, chemical	
4.0		Advanced Animal Nutrition Concepts	**08**
	4.1	New Concepts in Feeding of High Yielding Animals: Bypass Protein, Buffer Feeding	
	4.2	Feeding Standards: Milking cow, newly born calves Classification, History, and Limitations	
	4.3	Nutritional Requirements for breeding bull	
		Total	**30**

Reference Books

1. A text book of Animal husbandry: By G.C. Banerjee
2. A Text Book of Animal Nutrition" by D.N. Verma
3. Goat, Sheep and Pig, Production and Management" by Jagdish Prasad
4. Animal Nutrition" by S. K. Ranjhan (Indian Council of Agricultural Research, New Delhi)
5. Principles of Animal Nutrition" by D. N. Kamra (Oxford & IBH Publishing Co., New Delhi)
6. Animal Nutrition and Feeding" by G. S. Birthal (Kalyani Publishers, Ludhiana)
7. Fundamentals of Animal Nutrition" by Subodh Kumar Saha and Nitya Nand Pathak

SDRSCP-1202 Lab Course in Principles of Animal Nutrition (Major)

Practical- 60 Hrs	Subject Code: SDRSCP-1202
Total Marks for Evaluation: 50	No. of Contact Hours: One Practical /week, Credit: 2

Sr. No.	List of Experiments	Hrs.
1	Identification and collection of different feeding stuff	04
2	Preparation and Processing of Samples for Chemical Analysis: Silage	04
3	Estimation of Dry Matter in Feed Samples	04
4	Estimation of Total Ash in Feed Samples (Dry fodder)	04
5	Estimation of Crude Protein in Feed Samples (Green forrage)	04
6	Estimation of Ether Extract in Feed Samples	04
7	Estimation of Crude Fibre in Feed Samples	04
8	Determination of gross energy by Bomb's calorimeter	04
9	Computation of ration for milking cow	04
10	Formulation of Rations for sheep and goat	04
11	Visit to feed processing plant	10
12	Visit to Fodder agriculture farm	10
	Total	**60**

Swami Ramanand Teerth Marathwada University, Nanded.
DAIRY SCIENCE
NEP-2020 (Pattern)
B.Sc. Second Year (Semester-III)
Paper No. SDRSCP-1202
Name of Paper: Practical paper based on Theory paper No.1201

Practical Question Paper Performa

Time: 4hr Marks 50

Q.1. Spotting -10 spots (Equipments used in determination of feeds and fodder, parts of Digestive system, feed and fodder samples) 10

Q.2.Estimation of dry matter/crude protein/ ash /crude fibre/ ether extract from feed sample/Computation of ration 10

Q.3.Determination of energy value of feed/ nutrient requirement for different livestock/ silage making 10

Internal : 20

a) Record Book.
b) Excursion/ Visit Report and viva voce.

Swami Ramanand Teerth Marathwada University, Nanded

NEP-2020 (Pattern)
DAIRY SCIENCE
B. Sc. Second Year (Semester-III)

Name of Paper :- Dairy Farm Management (Major)

Theory	Subject Code: SDRSCT-1203
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite:-

The prerequisites for a Dairy Farm Management course generally include foundational knowledge in animal science, agriculture, and business management.

Course Objectives:

The Dairy Farm Management course aims to equip students with the knowledge and skills needed to efficiently manage dairy farms, ensuring optimal productivity, profitability, and sustainability. The specific objectives include:

- Introduce students to the different types of dairy farming systems and their management strategies.
- Teach proper feed formulation, ration balancing, and feeding strategies for different stages of dairy cattle production.
- Provide real-world experience through farm visits, case studies, and practical sessions in dairy farm operations.

Course Outcomes:

On successful completion of the course, students will equip with the knowledge and skills needed to efficiently manage a dairy farm.

- Proper feeding and nutrition management for high milk yield
- Practical skills in milking techniques and milk quality control
- Waste management and environmentally friendly dairy farming
- Use of modern dairy farming technologies and automation
- Understanding animal welfare and ethical dairy farming practices

B. Sc. Second Year (Semester-III)

Dairy Farm Management (Major) SDRSCT-1203

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
		Management	**08**
1.0	1.1	Introduction of Management	
	1.2	Definition of Management	
	1.3	Functions of Management i) Planning ii) Organizing, iii) Staff recruitment iv) Directing, v) Controlling, vi) Coordinating, vii) Communication and viii) Decision-making	
	1.4	Tools of Management – i) Farm records ii) Comparative budgeting iii) Annual Budgeting iv) Partial budgeting	
		Housing of Dairy Animal	**07**
2.0	2.1	Location of Dairy Farm Building (Selection of site)	
	2.2	Types of Housing Systems i) Loose Housing ii) Conventional Housing- i) Head to Head and ii) Tail to Tail	
	2.3	Water requirement of dairy animals	
	2.4	Drainage system in dairy farms	
	2.5	Disposal of dairy farm waste- Gobar gas unit	
		Management of Different classes of Dairy Animals	**07**
3.0	3.1	Management of Dry Animals, Methods of Drying off i) Complete cessation ii) Intermittent milking iii) Incomplete milking	
	3.2	Management of Heifer, Pregnant animals, Cow during and after parturition,	
	3.3	New born calf, raising of calves,	
		Management practices for dairy farm	**08**
4.0	4.1	Identification of dairy Animals i) Branding ii) Tatooing iii) Tagging iv) Ear notching	
	4.2	Dehorning of dairy animals i) Chemical method ii) Mechanical method- Clippers and saws, rubber band III) Electrical method	
	4.3	Castration of dairy animals i) Bloodless Method- a) Emasculation Method (Burdizzo)b) Rubber Band Method ii) Incision Method / Surgical Method	
		Total	30

Reference Books

1. A textbook of animal husbandry - G.C.Banerjee
2. Livestock production and management. - NSR Sastri & Thomas
3. Principles and practices of dairy farm management - Jagdish Prasad
4. Modern dairy cattle management - Wiltam N. Etgas
5. A textbook of animal Husbandry & Dairy Science - Jagdish Prasad.

SDRSCP-1204 Lab Course in Dairy Farm Management (Major)

Practical- 60 Hrs	Subject Code: SDRSCP-1204
Total Marks for Evaluation: 50	No. of Contact Hours: One Practical /week, Credit: 2

Sr. No.	List of Experiments	Hrs.
1	Study of Gir and Sahiwal	04
2	Study of Deoni and Red Kandhari	04
3	Judging dairy cattle based on score card method	04
4	Cleaning and disinfection of dairy sheds	04
5	To study Pre- and post-milking teat disinfection methods	04
6	Deworming of animals	04
7	Pregnancy diagnosis (Symptomatic and Chemical method)	04
8	To study waste management (Gobar gas)	04
9	To study various Identification methods of dairy animals (Photocopying, Electronic tagging with microchips)	04
10	Visit to Dairy Farm	08
11	Visit to veterinary clinic/college	08
12	Visit to cattle breeding farm	08
	Total	60

Swami Ramanand Teerth Marathwada University, Nanded.

DAIRY SCIENCE

NEP-2020 (Pattern)

B.Sc. Second Year (Semester-III)

Paper No. SDRSCP-1204

Name of Paper: Practical paper based on Theory paper No.1203

Practical Question paper Performa

Time: 4hr	Marks 50
Q.1. Spotting -10 spots (Equipments used in dairy farm management)	10
Q.2.Judging of cattle / cleaning protocols of dairy sheds / Deworming /	10
Q.3. Pregnancy diagnosis / Farm Waste management	10
Internal :	20

a) Record Book.

b) Excursion / Visit Report and viva voce.

Swami Ramanand Teerth Marathwada University, Nanded.

NEP-2020 (Pattern)
DAIRY SCIENCE
B. Sc. Second Year (Semester-III)

Name of Paper :- Milk Hygiene and Public Health (Minor)

Theory	Subject Code: SDRSCM-1205
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite

The prerequisites for a Milk Hygiene and Public Health course include:

- Basic understanding of microorganisms, their growth, and their impact on food safety.
- Introduction to food processing, dairy products, and quality control.
- Basic chemical principles relevant to milk testing and contamination detection.

Course Objectives

The Milk Hygiene and Public Health course is designed to educate students on safe milk production, processing, handling, and public health implications.

- To familiarize the student with the contamination sources, and quality parameters
- To Understand quality control measures in milk processing

Course Outcomes

Upon completing the Milk Hygiene and Public Health course, students will gain a comprehensive understanding of safe milk production, processing, and public health protection.

- Identify sources of contamination in milk production and processing
- Apply quality control measures to ensure safe dairy products
- Identify and prevent zoonotic diseases (e.g., brucellosis, tuberculosis, listeriosis).
- Apply public health principles to prevent milk-borne outbreaks

Milk Hygiene and Public Health (Minor) SDRSCM-1205

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
1		**Maintenance of Hygiene and Sanitation**	**07**
	1.1	Chemical Sanitizers and its application to dairy farm premises.	
	1.2	Disinfectants: Natural disinfectants and its applications to dairy farm premises	
	1.3	Ideal properties of detergents and sanitizers in dairy farm premises	
2		**Hygienic Practices at Farm Level**	**08**
	2.1	Animal hygiene – milker hygiene-	
	2.2	Utensils/equipment hygiene- hygiene during milking process	
	2.3	Mechanical Cleaning, and Ultrasonic Cleaning at dairy farm	
3		**Cleaning in Place at Dairy Industry**	**08**
	3.1	CIP: Definition, Application of CIP in Dairy Industry	
	3.2	Selection and use of dairy cleaners (Alkaline Cleaners, Acid Cleaners, Chlorinated Cleaners, Detergent-Sanitizers and Enzyme-Based Cleaners)	
	3.3	Sanitizers (Chlorine-Based Sanitizers, Iodine-Based Sanitizers, Peracetic Acid (PAA) Sanitizers, Quaternary Ammonium Compounds, Hydrogen Peroxide & Ozone)	
4		**Animal Products Safety**	**07**
	4.1	Role of veterinarians in animal health	
	4.2	Pesticide residues in milk and milk products	
	4.3	Heavy metal contamination in milk and milk products	
		Total	**30**

References:

1. Anantha Krishnan, C.P., (1991), Technology of milk processing, Sri Lakshmi Publications, Chennai -10.
2. Britz, T.J. and Robinson, R.K 2008. Advanced Dairy science and Technology.1 sted, BackwellPubl.Ltd., UK.
3. Harry S. Mustard.,(1960) An Introduction to Public Health, The Macmillan Co., New York.
4. Sukumar De (1980), Outlines of Dairy Technology, Oxford University Press, New Delhi
5. V.K.Muthu., (2005) A Short Book of Public Health, , JAPEE Brother Medical Pub.(P)Ltd New Delhi.
6. Walstra, P. Wouters, J.T.M. and Geurts, T.J. 2006. Dairy Science and Technology. CRC Press, New York.

SDRSMP-1206 Lab Course in Milk Hygiene and Public Health (Minor)

Practical -60 Hrs	Subject Code: SDRSMP-1206
Total Marks for Evaluation: 50	No. of Contact Hours: One Practical / week, Credit: 2

Sr. No.	List of Experiments	Hrs
1	Identification and labeling of milk samples	04
2	Organoleptic Examination of Milk	04
3	Preparation of ointments	04
4	Detection of mastitis in milk	04
5	Sanitary inspection of dairy farm	04
6	Determination of bacterial load (SPC)	04
7	Determination of Presence of E. coli	04
8	Assessment of milk quality based on bacterial activity (MBRT)	04
9	Detection of Adulterants in Milk	04
10	Detection of Preservatives in Milk	04
11	Visit to Dairy Farm	10
12	Visit to Milk Processing Plant	10
	Total	**60**

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DAIRY SCIENCE

NEP-2020 (Pattern)

B.Sc. Second Year (Semester-III)

Paper No. SDRSMP-1206

Name of Paper: Practical paper based on Theory paper No.1205

Practical Question paper Performa

Time: 4hr Marks 50

Q.1. Spotting -10 spots (Equipments and glasswares used in milk analysis, Veterinary aids) 10

Q.2.Determination of fat / SNF / TS of milk samples 10

Q.3.Determination of bacterial load / E.Coli / adulterants / preservatives 10

Internal : 20

c) Record Book.

d) Excursion / Visit Report and viva voce.

Swami Ramanand Teerth Marathwada University, Nanded

NEP-2020 (Pattern)
DAIRY SCIENCE
B. Sc. Second Year (Semester-III)

Name of Paper :- Poultry Farming (Generic Elective)

Theory	Subject Code: SDRSGE-1207
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite

The prerequisites for a Poultry Farming course include:

- Fundamental knowledge of poultry feed requirements, ration formulation, and feed management.
- An overview of poultry breeds, housing systems, and farming practices.
- Basic knowledge of poultry diseases, vaccination, and biosecurity.

Course Objectives

- Introduce various poultry farming systems, including backyard, commercial, and organic poultry production.
- Provide knowledge on different poultry breeds (layers, broilers, and dual-purpose birds) and their characteristics.
- Teach principles of poultry nutrition, feed formulation, and management for different production stages.

Course Outcomes

Upon successful completion of the Poultry Farming course, students will be able to:

- Identify and describe different types of poultry farming systems, including backyard, commercial, and organic farming.
- Design and maintain poultry housing with proper ventilation, lighting, and biosecurity measures.
- Apply hands-on experience in managing poultry farms, handling birds, and maintaining farm records.

B. Sc. Second Year (Semester-III)

Poultry Farming (Generic Elective) SDRSGE-1207

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
1		**Introduction to Poultry Farming**	**07**
	1.1	Importance and scope of poultry farming	
	1.2	Overview of the poultry industry	
	1.3	Terminologies used in poultry farming	
2		**Classification of poultry breeds**	**08**
	2.1	Layer Birds (White Leghorn, Rhode Island Red, Black Minorca)	
	2.2	Broiler Birds (Kadaknath, Cornish, White rock)	
	2.3	Dual-purpose Birds (Plymouth Rock, Sussex, Black astrolarp)	
3		**Poultry Housing and Farm Management**	**08**
	3.1	Types of poultry housing systems (deep litter, cage system, free-range)	
	3.2	Design, ventilation, and temperature control in poultry houses	
	3.3	Lighting programs and their effects on production	
4		**Production Management**	**07**
	4.1	Management of commercial layers for maximum egg production and marketing	
	4.2	Factors affecting egg quality and storage	
	4.3	Feeding management of broiler	
	4.4	Ranikhet, Gumboro, Bird flue, Fowl pox	
		Total	**30**

References:

1. कुक्कुटपालन - प्रा.डॉ.सुरेश लांडगे
2. A Text Book of Animal Husbandry- G.C. Banerjee
3. Commercial Poultry Production on Farm and in the Factory" – Michael R. Bedford & Mingan Choct
4. Poultry Production" – Richard M. Gous, Colin G. Fisher, Timothy R. Morris
5. Poultry Science" – Colin G. Scanes & George Brant
6. Modern Poultry Breeding" – S. R. Gnanamani
7. Poultry Nutrition" – Rick Kleyn
8. Applied Poultry Nutrition" – W. G. Pond & J. H. Maner
9. Nutrient Requirements of Poultry" – National Research Council (NRC)
10. Diseases of Poultry" – David E. Swayne
11. Poultry Health and Management" – Paul Barrow & Michael Davison
12. Poultry Diseases and Treatment" – H. V. S. Chauhan
13. Poultry House Construction and Management" – Lacy & Bell
14. Poultry Farming and Management" – N. J. Daghir

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NEP-2020 (Pattern)
DAIRY SCIENCE
B. Sc. Second Year (Semester-III)

Name of Paper :- Technology of Indigenous Dairy Products (Skill Based Course)

Theory	Subject Code: SDRSSC-1208
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Sr. No.	List of Experiments	Hrs
1	Preparation of Dahi	04
2	Preparation of Chakka and Shrikhand	04
3	Preparation of Khoa	04
4	Preparation of Peda and Burfi	04
5	Preparation of Rabri	04
6	Preparation of Basundi	04
7	Preparation of Channa / Panir	04
8	Preparation of Rasogolla	04
9	Preparation of Lassi	04
10	Preparation of Kulfi	04
11	Visit to sweetmart /	10
12	Milk product manufacturing unit	10
	Total	60

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NEP-2020 (Pattern)

DAIRY SCIENCE

B. Sc. Second Year (Semester-IV)

Name of Paper :- Artificial Insemination and Reproduction in Livestock (Major)

Theory	Subject Code: SDRSCT-1251
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite:- The course is offered for a students whose are enrolled IN B.Sc. programme in the faculty of science and technology had primary training in the field of Artificial Insemination and Reproduction centre of farm animals. The Students should have basic knowledge of collection of semen, artificial insemination and reproduction in farm animals

Course Objectives:

- To Make the students aware of various field's like Breeding, Collection of semen from genetic animals, Artificial Insemination. and understand the economical values in their area.
- To Develop the creativity in students through research and educate in this aspect and reinforce the message to animal care taker to protect Genetic livestock.

Course Outcomes:

- To understand history, scope and importance of livestock in life of human being.
- To describe the common uses of breeds in their neighbourhood for Agricultural fields as well as milk and meat etc. Production.
- To Conserve endangered and endemic species of livestock in their area.
- Job opportunities as wage employment in Artificial Insemination Assistant / Livestock Assistant / A.I. Operator in Animal Genetic centre / Farm Supervisor.

DAIRY SCIENCE

B. Sc. Second Year (Semester-IV)

Artificial Insemination and Reproduction in Livestock (Major) SDRSCT-1251

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
1.0		Reproduction in livestock	**07**
	1.1	Introduction to Animal Reproduction	
	1.2	Anatomy of reproductive system of Cattle	
	1.3	Study of Gametogenesis	
	1.4	Maturation of Sperm and Ovum	
2.0		Fertility and Breeding	**08**
	2.1	Puberty and Factors affecting Puberty	
	2.2	Oestrus Cycle and its phases	
	2.3	Fertility and Breeding efficiency in livestock	
	2.4	Sterility and causes of sterility	
3.0		Fertilization & semen collection	**08**
	3.1	Fertilization and Pregnancy in cattle	
	3.2	Parturition and its stages in cattle	
	3.3	Definition and composition of Semen	
	3.4	Collection Methods of semen (AV, Electro Ejaculation and Massage method)	
4.0		Artificial Insemination & Examination of semen	**07**
	4.1	Physical Evaluation of Semen	
	4.2	Microscopic Examination of semen	
	4.3	Definition of Artificial Insemination, Time and Technique of AI	
	4.4	Methods of Artificial Insemination	
		Total	30

Reference Books

1. A text book of Animal husbandry: By G.C. Banerjee
2. A text book of Animal science part A : By Dr. A.U. Bhikane and S.B. Kawitkar
3. A text books on Animal Genetics: By Dr. P. K.Kanakraj.
4. Animal Reproduction and Artificial Insemination : By A.K.Sacheti
5. Animal Genetic and Breeding By; Dr. Satish kulkarni & Dr. Pandurang Gangasagare.
6. Advances in Dairy Animal Production: By V.D.Mudgal, K.K.Singhal and D.D.Sharma
7. Hand books for Indian Dairy Farmers: By Patrick John

A text book of Veterinary science part : By Dr. A.U.Bhikane and S.B. Kawitkar

SDRSCP-1252 Lab Course in Artificial Insemination & Reproduction in Livestock (Major)

Practical- 60 Hrs	Subject Code: SDRSCP-1252
Total Marks for Evaluation: 50	No. of Contact Hours: One Practical /week, Credit: 2

Sr. No.	List of Experiments	Hrs.
1	Study of Reproductive organs of male and female cattle	04
2	Estimation of Breeding efficiency of Cow	04
3	Preparation of heat expectancy chart	04
4	Assembling of Artificial Vagina	04
5	Collection of semen by AV method	04
6	Study of AI equipment's and insemination in cow	04
7	Estimation of pH of semen	04
8	Preparation of semen extenders	04
9	Pregnancy diagnosis in cow (Palpation and Laboratory method)	04
10	Estimation of sire index	04
11	Visit to: Cattle and Buffalo Breeding Farm	10
12	Visit to : Semen collection and AI centre	10
	Total	60

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DAIRY SCIENCE

NEP-2020 (Pattern)

B.Sc. Second Year (Semester-IV)

Paper No. SDRSCP-1252

Name of Paper: Practical paper based on Theory paper No.1251

Practical Question paper Performa

4Hrs	50 marks
Q.1.Spotting - 10 (Reproductive organs, AI equipment, AV Parts, pH meter)	10
Q.2. Breeding efficiency / Heat expectancy chart / AV Method	10
Q.3. AI equipment's / pH of semen / semen extenders / Pregnancy diagnosis in cow / sire index	10
Internal :	20

a) Record Book.

b) Excursion / Visit Report and viva voce.

Swami Ramanand Teerth Marathwada University, Nanded

NEP-2020 (Pattern)

DAIRY SCIENCE

B. Sc. Second Year (Semester-IV)

Name of Paper :- Technology of Western Dairy Products (Major)

Theory	Subject Code: SDRSCT-1253
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite:-

The prerequisites for a **Technology of Western Dairy Products** course include:

- Fundamental understanding of milk composition, properties, and processing techniques.
- Basic knowledge of food preservation, processing methods, and quality control.
- Understanding of microbial fermentation, spoilage, and safety regulations in dairy products.
- Study of chemical changes in milk during processing, including pasteurization, fermentation, and coagulation.
- Prior experience or coursework in dairy product manufacturing, such as cheese, butter, yogurt, and ice cream.

Course Objectives:

The Technology of Western Dairy Products course aims to provide students with in-depth knowledge of the processing, quality control, and commercialization of Western dairy products. The key objectives include:

- Introduce various dairy products such as cheese, butter, yogurt, ice cream, whey-based products, and fermented dairy items.
- Explain the chemical, physical, and nutritional properties of milk and their influence on dairy product characteristics.
- Explain the classification of cheeses (soft, semi-hard, hard), rennet coagulation, starter cultures, ripening, and aging techniques.
- Study the formulation, emulsification, freezing, and stabilization processes in ice cream manufacturing.

Course Outcomes:

Upon successful completion of the Technology of Western Dairy Products course, students will be able to:

- Identify various Western dairy products such as cheese, butter, yogurt, ice cream, and whey-based products.
- Apply knowledge of rennet coagulation, starter cultures, ripening techniques, and cheese classification.
- Formulate and manufacture ice cream, ensuring proper emulsification, freezing, and texturization.
- Demonstrate the churning, separation, and quality control of butter, cream, and dairy spreads.
- Understand the commercial aspects of Western dairy product development, branding, and global market trends.

B. Sc. Second Year (Semester-IV)

Technology of Western Dairy Products (Major) SDRSCT-1253

Curriculum Details:-

Module	Unit	Topic	Hrs
			08
1.0	1.1	Classification of western dairy products	
	1.2	Yoghurt- Definition, Composition, Methods of manufacturing	
	1.3	Milk ices and lollies	
	1.4	Cream-Methods of separation, types, efficiency of cream separator, defects	
			07
2.0	2.1	Cheese - History, Definition, Composition, Classification	
	2.2	Cheese - Methods of manufacturing, Defects and Storage	
	2.3	Condensed milk - History, Definition, Composition, Types	
	2.4	Condensed milk - Methods of manufacturing, Defects and Storage	
			07
3.0	3.1	Ice-cream-History, definition, composition,	
	3.2	Ice-cream-Methods of manufacturing, Packaging, Hardening, storage and defects.	
	3.3	Butter -Definition, Composition, Manufacturing, Storage and defects.	
			08
4.0	4.1	Milk powder – Definition, composition, types (SMP, WMP),	
	4.2	Milk powder – Methods of manufacturing, (SMP, WMP),	
	4.3	Packaging, storage and defects.	
	4.4	Toned and Double Toned Milk	
		Total	**30**

Reference Books

1. Dairy Science and Technology, Second Edition – Pieter Walstra, Jan T. M. Wouters, Tom J. Geurts
2. Technology of Dairy Products – Ralph Early
3. Milk and Dairy Product Technology – Edgar Spreer
4. Fundamentals of Dairy Chemistry – Noble P. Wong
5. Dairy Processing: Improving Quality – G Smit
6. Dairy Chemistry and Biochemistry – P. F. Fox, P. L. H. McSweeney
7. Handbook of Dairy Foods and Nutrition – Gregory D. Miller, Judith K. Jarvis, Lois D. McBean

SDRSCP-1254 Lab Course in Technology of Western Dairy Products (Major)

Practical- 60 Hrs	Subject Code: SDRSCP-1254
Total Marks for Evaluation: 50	No. of Contact Hours: One Practical / week, Credit: 2

Sr. No.	List of Experiments	Hrs.
1	Preparation of Recombined milk	04
2	Preparation of reconstituted milk	04
3	Preparation of ice-cream	04
4	Cream separation	04
5	Determination of moisture % from milk products	04
6	Quality determination of milk powder by solubility index	04
7	Preparation of butter	04
8	Determination of fat from butter	04
9	Preparation of industrial casein	04
10	Determination of OR from ice-cream	04
11	Visit to Dairy plant	10
12	Visit to ice cream / Butter / Powder plant	10
	Total	60

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DAIRY SCIENCE

NEP-2020 (Pattern)

B.Sc. Second Year (Semester-IV)

Paper No. SDRSCP-1254

Name of Paper: Practical paper based on Theory paper No.1253

Practical Question paper Performa

Time: 4hr Marks 50

Q.1. Spotting -10 spots (Equipments and glasswares used in laboratory) 10

Q.2.Determination of fat / TS / Moisture of milk products / Preparation of Reconstituted milk 10

Q.3.Preparation of Recombined / Ice cream / Industrial casein / Butter 10

Internal : 20

e) Record Book.

f) Excursion / Visit Report and viva voce.

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NEP-2020 (Pattern)
DAIRY SCIENCE
B. Sc. Second Year (Semester-IV)

Name of Paper :- Farm Animal Health Management (Minor)

Theory	Subject Code: SDRSCM-1255
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite

- The course is offered to a students whose are enrolled for B.Sc. programme in the faculty of science and technology had primary training to know the different health issues of livestock
- The Students should have the basic knowledge of Immunity and different diseases of livestock and their treatment.

Course Objectives

- To Make the students aware of various field's of Dairy farming, Bacterial, viral, protozoan, deficiency and metabolic diseases and understand the economical values of treatment.
- To Develop the creativity in students through research and educate in this aspect and reinforce the message to animal health and care and management of livestock
- To aquatint the students with first aid measures of livestock.

Course Outcomes

- To understand history, etiology,symptoms,diagnosis and treatment of diseases
- To know the common diseases in their neighbourhood area and precaution from contagious diseases
- After completing one can work as a livestock supervisor in a various well established dairy farm animal clinical house.
- Job opportunities as wage employment in veterinary assistant / livestock assistant / Farm assistant.
- Self employment as a Dairy farm owner / livestock supervisor.

B. Sc. Second Year (Semester-IV)

Farm Animal Health Management (Minor) SDRSCM-1255

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
1		**Health**	**07**
	1.1	Introduction, Definition of disease	
	1.2	Classification of diseases	
	1.3	Symptoms of healthy animals	
	1.4	Symptoms of sick animals	
2		**Bacterial Diseases**	**08**
	2.1	Immunity and types of immunity	
	2.2	H.S: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	2.3	B.Q.: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	2.4	Anthrax: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
3		**Metabolic diseases**	**08**
	3.1	Milk-fever: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	3.2	Ketosis: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	3.3	Rickets: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	3.4	Pesticide-poisoning: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
4		**Viral Diseases**	**07**
	4.1	F.M.D. (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	4.2	Rinderpest: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	4.3	CowPox: (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
	4.4	Lumpi: Skin Disease (Etiology, Symptoms, Diagnosis Treatment & Control Measure)	
		Total	60

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References:

1. A text book of Animal husbandry: By G.C. Banerjee
2. A text book of Animal science part B : By Dr. A.U. Bhikane and S.B. Kawitkar
3. A text books on Animal Genetics: By Dr. P. K.Kanakraj.
4. Hand book of animal diseases : By Bhattacharjee
5. A Handbook of Veterinary Physicians: By Sapre

SDRSMP-1256 Lab Course in Farm Animal Health Management (Minor)

Practical -60 Hrs	Subject Code: SDRSMP-1256
Total Marks for Evaluation: 50	No. of Contact Hours: One Practical / week, Credit: 2

Sr. No.	List of Experiments	Hrs
1	External body parts of cow / Buffalo	4
2	Study of common appliances used in livestock farm	4
3	Study of Injection and Vaccination schedule of livestock	4
4	Study of preparation of ointment	4
5	Study of Pathological test - blood / urine test of livestock	4
6	Clinical examination of animals	4
7	Study of health records of sick animal	4
8	Study of casting of animals	4
9	Study of Farm layouts	4
10	Study of Mastitis test of dairy cow	4
11	Study of Physical examination of feces	4
12	Study of ageing / dentition in cattle	4
13	Visit to: A veterinary polyclinic	6
14	Visit to A organized dairy farm	6
	Total	60

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DAIRY SCIENCE

NEP-2020 (Pattern)

B.Sc. Second Year (Semester-IV)

Paper No. SDRSMP-1256

Name of Paper: Practical paper based on Theory paper No.1255

Practical Question paper Performa

Time: 4hr Marks 50

Q.1. Spotting -10 spots (Common appliances, Dental pad, Strip cup, Ointment, spatula, Casting rope and equipment) 10

Q.2.Casting/ ageing/first aid measure/Physical Examination of feces /Mastitis test 10

Q.3.Vaccination schedule/ farm layout/ ointment/Urine test/Pulse rate & Temperature 10

Internal : 20

g) Record Book.

h) Excursion/ Visit Report and viva voce.

Swami Ramanand Teerth Marathwada University, Nanded

NEP-2020 (Pattern)

DAIRY SCIENCE

B. Sc. Second Year (Semester-IV)

Name of Paper :- Goat Farming (Generic Elective)

Theory	Subject Code: SDRSGE-1257
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Course Prerequisite:-

The prerequisites for a Goat Farming course include:

- Basic understanding of animal physiology, genetics, and reproduction.
- Fundamental knowledge of feed formulation, pasture management, and nutritional requirements of small ruminants.
- Introduction to livestock species, farming systems, and husbandry practices.

Course Objectives:

The Goat Farming course aims to equip students with the knowledge and skills necessary for efficient and profitable small ruminant farming. The key objectives include:

- Introduce various breeds suitable for meat, milk, and fiber production, along with breed selection criteria.
- Teach appropriate housing systems, space requirements, and farm infrastructure for sheep and goats.
- Explain the nutritional requirements, feed formulation, and pasture management strategies.
- Provide field training in handling, feeding, disease control, and management of sheep and goats.

Course Outcomes:

Upon successful completion of the Goat and Sheep Farming course, students will be able to:

- Recognize different goat breeds for meat, milk, and wool production and choose appropriate breeds based on farming goals.
- Develop proper housing and infrastructure to ensure animal health, comfort, and productivity.
- Utilize natural and artificial breeding techniques, manage pregnancy, and ensure high fertility rates.
- Apply practical experience in animal handling, feeding, healthcare, and general farm management.

B. Sc. Second Year (Semester-IV)

Goat Farming (Generic Elective) SDRSGE-1257

Curriculum Details:-

Module No.	Unit No.	Topic	Hrs
1.0		**Introduction to Goat Farming**	**08**
	1.1	Introduction and importance of goat farming	
	1.2	Common terminologies used in goat farming	
	1.3	Role of goat in national economy	
2.0		**Housing management**	**07**
	2.1	Housing systems of goat (Tethering, Indoor, Intensive, Semi intensive)	
	2.2	Design and layout of goat sheds	
	2.3	Ventilation, drainage and waste management	
3.0		**Breeds of goat**	**07**
	3.1	Meat purpose breeds (Boer, Black Bengal, Osmanabadi)	
	3.2	Milk purpose breeds (Saanen, Alpine, Jamunapari)	
	3.3	Dual-purpose breeds (Beetal, Barbari, Nubian)	
	3.4	Important Goat Diseases - FMD, Rinderpest, Goat pox	
4.0		**Routine Management Practices**	**08**
	4.1	Identification, Castration, and Trimming	
	4.2	Management of Doe and Buck	
	4.3	Feeding management of Buck and kid,	
	4.4	Preparation of project report for 50 goats	

Reference Books

1. शेळी पालन व्यवसाय, लेखक प्रा.डॉ.सुरेश लांडगे
2. A Text Book of Animal Husbandry- G.C. Banerjee
3. Goat Science and Production – Sandra G. Solaiman
4. Storey's Guide to Raising Meat Goats – Maggie Sayer
5. Goat Production and Supply Chain Management in the Tropics" – Pramod Kumar Rout, A. B. Mandal, Gopal Sankhala
6. Goat Farming: A Comprehensive Guide to Breeding, Health, and Management" – Alan Mowlem
7. Goat Breeds Around the World" – Valerie Porter
8. Goat Production" – Roger C. Gall
9. Nutrient Requirements of Small Ruminants" – National Research Council (NRC)
10. Feeding and Nutrition of Small Ruminants – Mahgoub O., Kadim I. T., Webb E. C.
11. Diseases of the Goat" – John G. Matthews
12. Commercial Goat Farming Handbook – Agtech Publications
13. Goat Production and Climate Change" – Pramod Kumar Rout

Swami Ramanand Teerth Marathwada University, Nanded

NEP-2020 (Pattern)

DAIRY SCIENCE

B. Sc. Second Year (Semester-III)

Name of Paper :- Dairy By-Products (Skill Based Course)

Theory	Subject Code: SDRSSC-1258
Total Marks for Evaluation: 50	No. of Contact Hours: 2hr / week, Credit: 2

Curriculum Details:-

Sr. No.	List of Experiments	Hrs
1	Preparation of flavoured milk from skim milk	4
2	Preparation of butter milk	4
3	Importance of butter milk in human diet	4
4	Dried butter milk	4
5	Manufacturing of edible casein	4
6	Manufacturing of industrial / non edible casein	4
7	Preparation of sweetened condensed milk	4
8	Preparation of whey beverage	4
9	Preparation of whey protein concentrate	4
10	Processing and utilization of ghee residue	4
11	Study of of ghee residue products	4
12	Visit to butter plant and ghee plant	08
13	Visit to chocolate production plant	08
	Total	60

.**References:**

1. Whey Processing, Functionality, and Health Benefits – Charles Onwulata & Peter Huth
2. Dairy Chemistry and Biochemistry – P. F. Fox & P. L. H. McSweeney
3. Dairy Processing: Improving Quality – G. Smit
4. Technology of Dairy Products – Ralph Early
5. Fundamentals of Dairy Chemistry – Noble P. Wong