।। सा विद्या या विमुक्तये ।।

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

"ज्ञानतीर्थ" परिसर, विष्णुपूरी, नांदेड - ४३१६०६ (महाराष्ट्र)

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED

"Dnyanteerth", Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)

Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'A' Grade

25 1994 - 2019 SILVER JUBILEE YEAR

ACADEMIC (1-BOARD OF STUDIES) SECTION

Phone: (02462) 229542
Fax : (02462) 229574
Website: www.srtmun.ac.in
E-mail: bos.srtmun@gmail.com

संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक ०८ जून २०१९ रोजी संपन्न झालेल्या ४४व्या मा. विद्या परिषद बैठकीतील ऐनवेळचा विषय क्र.११/४४–२०१९** च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्यात येत आहेत.

1. Agricultural Microbiology
2. Agrochemicals & Fertilizers
3. Analytical Chemistry
4. B.C.A.
5. B.Voc. (Food Processing, Preservation and Storage)
6. B.Voc. (Web Printing Technology)
7. Biochemistry
8. Bioinformatics
9. Biophysics
10. Biotechnology (Vocational)
11. Biotechonology
12. Botany
13. Chemistry
14. Computer Application (Optional)
15. Computer Science (Optional)
16. Computer Science
17. Dairy Science
18. Dyes and Drugs
19. Electronics
20. Environmental Science
21. Fishery Science
22. Food Science
23. Geology
24. Horticulture
25. Industrial Chemistry
26. Information Technology (Optional)
27. Mathematics
28. Microbiology
29. Network Technology
30. Physics
31. Software Engineering
32. Statistics
33. Zoology

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

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.: शैक्षणिक–०१/परिपत्रक/पदवी–सीबीसीएस अभ्यासक्रम/२०१९–२०/२९२
दिनांक : ०३.०७.२०१९.

स्वाक्षरित/–
उपकुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :

१) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY,
NANDED

SYLLABUS

Of

B.Sc. – I Year

Choice Based Credit System (CBCS)

(Semester Pattern)

DAIRY SCIENCE

Effective from June - 2019

Distribution of credits for B.Sc. **Dairy Science** (optional)

Under Faculty of Science

B. Sc. Syllabus structure

Semester Pattern effective from June 2019

Subject: Dairy Science

Semester	Paper No.	Name of the Course	Instruction Hrs/ week	Total period	Internal Evaluatio	Marks of Semester	Total Marks	Credits
I	CCDS I (Section A)	Dairy Farming in India (PI))	03	45	10	40	50	2
	CCDS I (Section B)	Milk and Physiology of Lactation (PII)	03	45	10	40	50	2
II	CCDS II (Section A)	Processing Technology of Milk (P-III)	03	45	10	40	50	2
	CCDS II (Section B)	Farm Animal Health Management (PIV)	03	45	10	40	50	2
	CCDSP I [CCDS I & II (Section A & B)]	Practical's based on Section A & Section B of CCDS I & CCDS II (PV)	04	20 Practical	20	80	100	4

Total credits semester I and II: 12

III	CCDS III (Section A)	Dairy Animal Management (P-VI)	03	45	10	40	50	2
	CCDS III (Section B)	Technology of Indigenous Milk Products (P-VII)	03	45	10	40	50	2
	CCDSP III [CCDS III & IV (Section B)]	Practical's based on P-VI & P-VIII (P-X)	04		10	40	50	2
	CCDSP II [CCDS III & IV (Section B)]	SEC I (1 Skill/ optional)			15×3 = 45	-	-	(02)*
IV	CCDS IV (Section A)	Sheep, Goat, Pig and Poultry Farming (P-VIII)	03	45	10	40	50	2
	CCDS IV (Section B)	Technology of Western Dairy Products (P-IX)	03	45	10	40	50	2
	CCDSP II [CCDS III & IV (Section A)]	Practical's based on P-VII & P-IX (P-XI)	04	20 practical	10	40	50	2
	CCDSP III [CCDS III & IV (Section B)]	SEC II (1 Skill			15×3 = 45	-	-	(02)*
Total credits semester III and IV								12(04)*

Semester	Course No.	Name of the Course	Instruction Hrs/ week	Total period	Internal Evaluation	Marks of Semester	Total Marks	Credits
V	DECDS I (Section A)	Animal Nutrition (P-XII)	03	45	10	40	50	2
	DECDS I [(Section B) Elective]	Reproduction in Farm Animals (P-XIII)	03	45	10	40	50	2
	DECDSP II) [DECDS I & II (Section B)]	Practical's based on P-XII & PXIV (P-XVI)	04	20 Practical	10	40	50	2
	DECDSP II [DECDS I& IV (Section B)]	SEC III (1 Skill/ optional)			15×3 = 45	-	-	(02)*
VI	DECDS II (Section A)	Forage Production, Feeds and Feeding (P-XIV)	03	45	10	40	50	2
	DECDS II [(Section B) Elective]	Animal Genetics and Breeding (P-XV)	03	45	10	40	50	2
	DECCDSP I [DECDS I & II (Section A)]	Practical's based on P - XIII & P-XV (P-XVII)	04	20 Practical	10	40	50	2
	DECDSP II(Section B)	SEC IV (Project))			5O	-	50	(2)*
						Total credits semester V and VI		12(04)*

Swami Ramanand Teerth Marathwada University, Nanded

B.Sc. First Year DAIRY SCIENCE

Choice Based Credit System (CBCS) - Semester Pattern

Objectives :-

The course in planned to acquaint the students with

I. Farming aspects in livestock and poultry so as to prepare themselves for future Prospectus

II. Geographical distribution & trends in population growth

III. Role in national economy

IV. Their socio-economic aspects

V. Role of NDDB, Co-Op. Society, Role of OFP.

VI. Sanitary and hygienic conditions in Animal farm

VII. Establishment of Dairy Farm

VIII. Study of various diseases and disorders in livestock

IX. Milk, it's composition, properties & nutritive Values

X. Physiology of Lactation

XI. Milk utilization trends in India

XII. Disposal of farm waste & Carcass, Recycling of waste.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY
NANDED

Choice Based Credit System (CBCS)

Semester Pattern

DAIRY SCIENCE

B.Sc. F.Y.-CCDS I and Semester -I

Section A
Theory Paper I

Title – Dairy Farming in India

Marks – 50/Credit 2+0 **3 Periods per week** **Total Periods 45**

Unit – I	**No. of periods**
❖ Introduction to Dairy farming in India. ❖ History of Domestication of Dairy animals. ❖ Taxonomic classification of Dairy animals. ❖ Animal Husbandry in India – present and future. ❖ Common terminologies used in Animal husbandry.	**10**
Unit – II	**13**
❖ Animal husbandry regions in India. ❖ Animal adaptation and behavioral patterns. ❖ Cattle and Buffalo : Role in national Economy ❖ Study of Dairy farming system in India ❖ Role of Dairy co-operatives, NDDB and OFP in enhancing milk production	
Unit – III	**12**
❖ Establishment of Dairy farm ❖ Selection of site. ❖ Different structures and their location and space requirement and housing materials. ❖ Capital – Types, ways of raising.	
Unit – IV	**10**
❖ Types of housing for Dairy animals. ❖ Water supply, light & ventilation, Drainage system. ❖ Disposal of Carcass and Recycling of Dairy animal Wastes ❖ Maintenance of sanitary and hygienic conditions on farm.	

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY
NANDED

Choice Based Credit System (CBCS)

Semester Pattern

DAIRY SCIENCE

B.Sc. F.Y.-CCDS I and Semester -I

Section B
Theory Paper II

Title – Milk and Physiology of Lactation

Marks – 50/Credit 2+0	**3 Periods per week**	**Total periods 45**
Unit – I		**No. of periods**
❖ Introduction to the subject		08
❖ Production and Utilization trends of milk in India		
❖ Lactation, Lactation Period		
❖ Morphology and anatomy of Udder		
Unit – II		**15**
❖ Endocrine glands and Hormones in milk secretion		
❖ Theories of milk secretion		
❖ Physiology of milk secretion		
❖ Milk : Definition, Composition.		
Unit – III		**12**
❖ Study of major milk constituents		
❖ Water – physical state of milk ○ Proteins in milk		
❖ Lactose in milk		
❖ Lipids in milk		
❖ Study of minor constituents of milk		
❖ Nutritive value of milk		
Unit – IV		**10**
❖ Factors affecting quality and quantity of milk		
❖ Physical and chemical properties of milk		
❖ Sources of contamination in milk		
❖ Clean milk production		
❖ Classification of Bacteria and Fermentation of Milk.		

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY
NANDED

Choice Based Credit System (CBCS)

Semester Pattern

DAIRY SCIENCE

B.Sc. F.Y.-CCDS II and Semester -II

Section A
Theory Paper III
Title – Processing Technology of Milk

Marks – 50/Credit 2+0 **3 Periods per week** **Total periods -- 45**

Unit – I	**No. of periods**
❖ Procurement of milk : Collection and Transportation, Cooling of milk	**13**
❖ Milk Processing – a) Straining, Filtration, Clarification b) Pasteurization LTLT, HTST c) Homogenization d) Sterilization	
UNIT – II	**12**
❖ Legal standards – HACCP, FSSAI, Judging & Grading of milk. ❖ Pricing policy ❖ Standardizing and toning of milk. ❖ Storage and milk packaging ❖ Distribution of milk	
UNIT- III	***10***
❖ Layout of milk processing plant ❖ Flooring, Ventilation, Doors, Windows ❖ Drainage system, washing unit ❖ Rodent control ❖ Maintenance of hygiene	
UNIT – IV	***10***
❖ Milk and Metals used in Dairy Industry. ❖ Steam: Forms, Generation & Uses. ❖ Refrigeration ❖ Dairy effluent treatment and Disposal	

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY
NANDED

Choice Based Credit System (CBCS)

Semester Pattern

DAIRY SCIENCE

B.Sc. F.Y.-CCDS II and Semester -II

Section B
Theory Paper IV

Title – Farm Animal Health Management

Marks – 50/Credit 2+0 **3 Periods per week** **Total periods 45**

Unit – I	**No. of periods 10**
❖	Identification of sick animals.
❖	Study of healthy conditions in farm animals.
❖	Classification of Diseases
❖	Common terminologies used in animal treatment ; like ointment, purgatives & laxatives, tonics, lotions, emulsion, astringent, liniments, enema, disinfectants.
❖	Immunology : Definition, concept, types.
Unit-II	**14**
❖	Study of diseases of economic importance (With reference to causative organism, pathogenesis, etiology, symptoms, prevention, treatment and measures) FMD, RP, HS, BQ, Anthrax, Brucellosis.
❖	Dystokia, prolapsed of uterus and vagina
❖	Diseases of Lactating cows : Mastitis, Milk fever, Ketosis.
Unit-III	**10**
❖	Diseases of calf : Pneumonia, calf scours, diarrhea, Joint ill, Naval ill, Worm infestation, Rickets
❖	Parasitic and protozoan diseases: Theilariasis, Babesiosis, Trypansomiasis , Trichomoniasis.
❖	Control of Ecto and Endo parasites of animals.
Unit-IV	**10**
❖	Diseases of sheep and Goat : PPR, blue tongue.
❖	Diseases of pigs : swine fever / Hog cholera
❖	Diseases of poultry : Ranikhet, Coccidiosis, Marek's, Gumboro.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY
NANDED

Choice Based Credit System (CBCS)

Semester Pattern

DAIRY SCIENCE

B.Sc. F.Y.-CCDSP-I and Annual Pattern

Practical Paper V

Practicals based on CCDS – I (Section A & B) And CCDS – II (Section A & B)

Marks – 100/Credit 0+4 **4 Periods per week**

---

1) Morphology of cattle and buffalos
2) Linear Body measurements – Body wedges and estimations of body weight.
3) Study of Udder
4) Recording Temperature, pulse rate, respiration, Heart rate and Auscultation
5) Drenching, Injections and Vaccinations.
6) Pathological tests – Blood tests, Urine tests, Test for mastitis.
7) Preparation of drugs like, ointment/liniment/bolus
8) Sampling of Milk
9) Organoleptic evaluation of milk / platform tests.
10) Determination of Specific gravity.
11) Determination of Acidity and pH.
12) Determination of Viscosity.
13) Determination Electrical conductivity and Refractive Index
14) Determination of Fat.
15) Determination of SNF, TS.
16) Record keeping.
17) Farm layout.
18) Visit to – Dairy farm, Dairy plant,
    Agricultural and Veterinary College,
    Veterinary Hospital.

List of Equipments, Glass ware's materials for Practical's

Models/ Charts / Photographs of cattle and buffalo.

Various types of sanitizers, disinfectants

Thermometer, Stethoscope

Digital balance

Equipments and materials for preparation of various drugs

Glucometer, aemoglobinometer, glass wares and equipments for various

pathological tests.

Housing models

Injection-vaccination equipments

Model of Udder,

figures showing internal and external structure

Platform test equipment

Centrifugal fat testing machine,

milk – o – tester, Milk analyzer

pH meter, pH paper

Oven, Viscometer

Electrical conductivity meter

Laboratory glass wares and required chemicals Richmand's scale for TS

Refractomater

-: List of Reference Books :-

1. A text Book of Animal Husbandry - G.C. Banerjee
2. Advances in Dairy animal Productions - Mudgal
3. Animal Husbandry and Rural Development - Kar
4. Dairy cattle and Milk production - Eckles
5. Disease of Animal Transmissible to man - Thpliyal
6. Fundamentals of Animal Hygiene and Epidemiology - Thypliyal
7. Handbook Animal Diseases - Bhattacharjee
8. Instant veterinary Drug Index – Dabax
9. Poultry Diseases of Farmers – Vegad and Suresh
10. Handbook of Veterinary Physicians – Sapre
11. Handbook of Animal Husbandry – ICAR
12. Livestock and Poultry Production – Singh & Moore
13. Animal Husbandry and Dairy Science – Jagdish Prasad
14. Dairy Bovine Production – C.K. Thoms & NSR Sastry
15. Treaties and Treatment Vol I & II – Srinivasn
16. Livestock Health and Housing – David and Peter
17. Dairy Cattle Science – Ensmiger
18. Veterinary Medicine – Blood and Handerson
19. Principles and Practices in Dairy farm Management – Jagdish Prasad
20. A Student Laboratory manual of veterinary physiology – Sharma
21. A Handbook of Veterinary Physician – V.A. Sapre

    A text book of Animal Science – A.U.Bhikane,& S.B.Kawitkar
22. Multiple Choice Questions in Animal Husband ry – K.G. Dande & Gaikwad S. M.
23. Management of Animals – Satish Kulkarni
24. Outlines of Dairy Technology - S. K.De
25. Milk and Milk Products - Eckless, Combs and Macacy
26. Milk and Milk Products Technology - Mohammad Raziuddin and Ashok Hembade.
27. Dairy Chemistry - M.M.Rai
28. Principals of Dairy Chemistry - Jeneess & Patton
29. A Text book of Dairy Chemistry - N.C.Ganguly
30. Fundamentals of Dairy Chemistry - Web &Jonson
31. Dairy Chemistry -Fox

32. Dairy Processing - JamesWarner
33. Hand book of Dairy Science - K.C.Mahanta
34. Dictionary of Dairying - Davis &
LeonardHill Engineering for Food and Dairy Processing - E.M.Farrell
35. Dairy Plant-Management and Engineering - TufailAhemad
36. Text book of Practical Dairy Chemistry - N.K. Roy & D.C.Sen
37. Milk Testing - J.G.Davis
38. Dairy Microbiology - K.C.Mahanta
39. Dairy Bacteriology -Hammer
40. Fundamentals of Dairy Microbiology - J.B. Prajapati
41. Standard Methods for Examination of Dairy Products - GaryH. Richardson
42. Market Milk Industry - C.I. Rhodhouse & J.L.Henderson
43. Comprehensive Dairy Microbiology - Yadav, Batish andGrover
44. A Text Book of Animal Husbandry - G.C.Banerjee
45. The Fluid Milk Industry-Henderson -ISI Specifications - BISPublication
46. Technology of Dairy plant operations - K.P.S.Sangwan
47. Technology of milk processing - C.P. Anantakrishnan, A.Khan And P.N. Padmanabhan
48. Milk and Its properties - S.M.Srivastava
49. Chemical & Microbiological Analysis of Milk & Milk projects - Ramakant Sharma

Dr. A.S. Hembade

Chairman

(Board of Studies in Dairy Science)

B.Sc. F.Y. CBCS Annual Patter

Practical Question Paper Proforma

CCDSP – I

Marks 100

Q.1 Spotting – (10 spots) Dairy equipments / Glasswares / specimen/model	20
Q.2 Linear body measurements and estimation of body weight/ Study of Udder	10
Q.3 Taking Body Temperature, Pulse rate, respiration rate, Heart rate/ Pathological tests/Sensory evaluation of milk	10
Q.4. Determination of specific gravity /acidity and PH/electrical conductivity and Refractive Index.	15
Q.5. Determination of milk fat/TS & SNF/Viscosity	15
Q.6. Preparation of Ointment/Liniment/Vaccination schedule/ Submission of farm layout.	10
Internal /CA : Record Book & Viva-voce	10
Excursion Report / Visit Report.	10