।। 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

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 पदव्युत्तर स्तरावरील द्वितीय वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक २० जून २०२० रोजी संपन्न झालेल्या ४७व्या मा. विद्या परिषद बैठकीतील विषय क्र.११/४७–२०२०**च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदव्युत्तर स्तरावरील द्वितीय वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्यात येत आहेत.

1. M.Sc.-II Year-Botany
2. M.Sc.-II Year-Herbal Medicine
3. M.Sc.-II Year-Analytical Chemistry
4. M.Sc.-II Year-Biochemistry
5. M.Sc.-II Year-Organic Chemistry
6. M.Sc.-II Year-Physical Chemistry
7. M.Sc.-II Year-Computer Management
8. M.Sc.-II Year-Computer Science
9. M.Sc.-II Year-Information Technology
10. M.C.A. (Master of Computer Applications)-II Year
11. M.Sc.-II Year-Software Engineering
12. M.Sc.-II Year-System Administration & Networking
13. M.Sc.-II Year-Dairy Science
14. M.Sc.-II Year-Environmental Science
15. M.Sc.-II Year-Applied Mathematics
16. M.Sc.-II Year-Mathematics
17. M.Sc.-II Year-Microbiology
18. M.Sc.-II Year-Physics
19. M.Sc.-II Year-Zoology
20. M.Sc.-II Year-Biotechnology
21. M.Sc.-II Year-Bioinformatics

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–१/परिपत्रक/पदव्युत्तर–सीबीसीएस अभ्यासक्रम/२०२०–२१/**३३५**

दिनांक : १६.०७.२०२०.

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

M. Sc. Second Year

DAIRY SCIENCE

Semester Pattern
(CBCS Pattern)
Effective from 2020-21

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
CHOICE BASED CREDIT SYSTEM (CBCS)
SEMESTER PATTERN

Faculty of Science

Post Graduate (PG) Programmes

DAIRY SCIENCE – CURRICULUM

w.e.f. Academic year 2020-21

M.Sc. Dairy Science Second Year curriculum

SEMESTER – III

An outline:

Paper No.	Name of Paper & No.	External (ESE)	Internal (CA)	Total
XI	Dairy Engineering-I	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XII	Dairy Microbiology-I	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XIII	Dairy Engineering-II	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XIV	Dairy Business Management and Co-operation	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XV	Seminar	Credit – 1 25 Marks		Credit : 1
			Total For Semester – III	**Credit : 17**
SEMESTER IV				
XVI	Packaging and quality Assurance	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XVII	Dairy Microbiology II	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XVIII	Dairy plant management	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XIX	Heritage Dairy Products of Indian – Elective	Credit – 3 75 Marks	Credit : 1 (25 Marks) Test 15 marks + Assignments 10 Marks	Credit :4 100 Marks
XX	Seminar	Credit : 1 25 Marks		Credit : 1
			Total For Semester – IV	**Credit : 17**
LAB COURSEWORK ANNUAL PRACTICAL				
LC-05	Lab Course work – 05 Based on XI + XVI	Credit – 3 75 Marks	Credit : 1 (25 Marks)	Credit :4 100 Marks
LC-06	Lab Course work –06 Based on XII + XVII	Credit – 3 75 Marks	Credit : 1 (25 Marks)	Credit :4 100 Marks
LC-07	Lab Course work –07 Based on XIII +XVIII	Credit – 3 75 Marks	Credit : 1 (25 Marks)	Credit :4 100 Marks
LC-08	Lab Course work – 08 Dissertation + in plant training of 6 week duration course work	Credit – 3 75 Marks	Credit : 1 (25 Marks)	Credit :4 100 Marks
Total For Lab Course Work (Annual)				**Credit : 16**
Total for M.Sc. II year : Sem. III + Sem. IV + Lab course work (Annual)				**Credit : 50**
Total for M.Sc. I year + II year.				**Credit :100**

Semester - III
Dairy Science
Theory Paper - XI
Dairy Engineering – I

Total Period : 45

Period per week – 04 **Credits : 04**

Objectives :

- To inculcate the knowledge regarding various engineering materials used in dairy industry.
- Installation and operations of various equipments and machines used in dairy plant.
- Unit operations.
- Various Lay-out procedures.

UNIT – I : **12**

- **Dairy Engineering Materials, Lay-out and fluid flow.**
- Introduction to Dairy Engineering.
- Engineering properties of milk & milk products.
- Various materials for dairy plant, Machineries and equipments.
- Design and Lay-out of dairy plant (Chilling Centre, Mini dairy plant, Composite milk processing plant)

UNIT – II : **11**

- **Utility / Services for dairy plant.**
- Water supply, Quality of water, water softening treatment for boiler use. Boiler safety devices.
- Study of boilers, Type, installation, working operation.
- Boiler fuels
- Steam pipelines – Installation, care and maintenance Boiler safety regulation.

UNIT – III : **11**

- **Heat and heat transfer.**
- Heat transfer principle and laws.
- Types of heat exchangers, their installation and working
- Microwave heating of milk and milk products.
- Evaporators and dryers.
- Humidifiers.

UNIT – IV : **11**

Pumps and fluid flow.

- ❖ Study of pumps used in dairy industry.
- ❖ Fluid flows.
- ❖ Valves and pipe fittings.
- ❖ Electricity and power supply
- ❖ Types of motors and starters.

Reference Books.

- ➢ A text book of Dairy Engineering – C. N. Hall
- ➢ Engineering for Dairy and Food products – E.M. Farral
- ➢ Dairy plant Engineering and management – Tufail Ahmad.
- ➢ Food engineering and Dairy Technology – Ing. H.C. Kessler.
- ➢ Modern Dairy Technology and engineering – Harpar and Hall
- ➢ UHT Processing of milk and milk products.
- ➢ Heat transfer – C. P. Gupta and Rajendra Prasad.
- ➢ Principles of unit operations – Alon S. Fouretal
- ➢ Fluid mechanics – Yuan
- ➢ Process equipment Design – Hasse and Ruston
- ➢ Refrigeration, Air Conditioning and environmental pollution control – Kadabmi
- ➢ Engineering properties of foods – M.A. Rao and S.S.H. Razwi
- ➢ Dairy engineering technology and Engg. Fo dairy plant operations – C.P. Anantkrishnan and simha N.N.

Semester - III
Dairy Science
Paper - XII
Dairy Microbiology – I

Total Period: 45

Period per week – 04 **Credits: 04**

Objectives:

- To provide advanced knowledge of various aspects of dairy microbiology
- Study of advances in dairy microbiology
- To know recent techniques in microbiology
- Various Lay-out procedures.
- To study proposition of starter cultures.

Unit – I: **12**

- **Historical and introductory Dairy Microbiology.**
  - Introduction to cell biology
  - Structural difference in Eukaryotic and prokaryotic cells.
  - Historical background of microbiology
  - Classification of various groups of microorganism associated with industry.

Unit – II : **08**

- **Fermentation.**
  - Reproduction and growth of Bacteria, Types of bacteria
  - Desirable and undesirable formulation in milk of dairy products.
  - Causes, prevention and biochemical changes associated with fermentation.

Unit – III : **12**

- **Starter Culture**
  - Importance of starter culture in dairy industry.
  - Propagation and preservation of dairy starters.
  - Recent developments in dairy starter industry, like starter concentration, starter distillates and direct-vat-set (DVS) cultures.

- Study of yoghurt, kefir and Kumiss.

Unit – IV : **13**

- **Microbiology of milk**
  - Sources of milk contamination and their control.
  - Microfora of raw milk
  - Microflora of market milk.
  - Microbiology of pasteurized of sterilized milk
  - Diseases transited through milk and milk products.']
  - Milk products and human health.

Reference Books:

- Dairy microbiology I & II – R. K. Robinson
- Compressive dairy microbiology – Yadav, Batish and Grover.
- Fundamentals of Dairy microbiology : J. B. Prajapati
- Testing of milk and milk product : Atherton and Newlender

Semester - III
Dairy Science
Paper - XIII
Dairy Engineering – II

Total Period : 45

Period per week – 04 **Credits : 04**

Objectives :

- To know the installation and working principles of various equipments and machineries.
- To know the conveying methods used in dairy plant.

Unit – I : **12**

Equipments and machineries :

- Components, installation, working and maintenance of chillers.
- Filters, Types, installation, working and maintenance.
- Milk separators and clarifiers.
- Pasteurizer, Vacreator.
- Milk homogenizer-types, working, cave and maintenance.

Unit – II : **10**

Equipments and Milk storage:

- Butter churners – types, Installation, Working and maintenance.
- Ice-cream freezers – types and working.
- Ghee vat
- Cheese vat
- Milk storage tanks and milk silos.

Unit – III : **11**

Conveying systems:

- Definition and objectives.
- Types of conveyors used in dairy industry
- Maintenance of conveying system.
- Calculations of conveying load.

Unit – IV : **12**

Washers :

- ❖ Can washers – Types, installation, working and care and maintenance.
- ❖ Filters, Types, installation, working and maintenance.
- ❖ Bottle washers – Types, installation, working and maintenance.
- ❖ Create washers – Types, installation, working and maintenance.
- ❖ Sonic vibrators.
- ❖ CIP system.

Reference Books.

- ➢ A text book of Dairy Engineering – C. N. Hall
- ➢ Engineering for Dairy and Food products – E.M. Farral
- ➢ Dairy plant Engineering and management – Tufail Ahmad.
- ➢ Food engineering and Dairy Technology – Ing. H.C. Kessler.
- ➢ Modern Dairy Technology and engineering – Harpar and Hall
- ➢ UHT Processing of milk and milk products.
- ➢ Heat transfer – C. P. Gupta and Rajendra Prasad.
- ➢ Principles of unit operations – Alon S. Fouretal
- ➢ Fluid mechanics – Yuan
- ➢ Process equipment Design – Hasse and Ruston
- ➢ Refrigeration, Air Conditioning and environmental pollution control – Kadabmi
- ➢ Engineering properties of foods – M.A. Rao and S.S.H. Razwi
- ➢ Dairy engineering technology and Engg. Fo dairy plant operations – C.P. Anantkrishna and simha N.N.

Semester – III

Dairy Science

Theory Paper - XIV

Dairy Business Management and Co-operation

Total Period : 45

Period per week – 04 **Credits : 04**

Objectives :

i) To study the challenges and opportunities of dairy entrepreneurs in India.

ii) To know the various principle of cooperation and cooperative movement for dairy industry.

iii) To study the demand and supply of milk and milk product.

iv) To study financial management and cost accounting with respect to dairy industry.

v) To study the marketing management of milk and milk products and pricing policies of milk procurement.

UNIT – I : **11**

Business Administration and pricing policy :

- Resource planning and pricing policies of milk procurement.
- Sources of finance : study of financing agencies for dairying.
- Demand Analysis: Law of demand, Determinants of demand, types of demand, elasticity of demand, forecasting, etc. and law of supply.

UNIT – II : **11**

Finance Management :

- Financial management and cost Accounting : profit and loss statement, balance sheet, cash flow capital manage.
- Statements, BEP, inventory management, different cost concept, etc.

UNIT – III : **12**

Marketing Management :

- ❖ Definition, scope, function and importance of marketing management.
- ❖ Market planning, Market segmentations, Marketing mix-4 Ps, Marketing research, etc. with respect to milk and milk products.
- ❖ Types o marketing strategies and different channels mostly used for milk procurement.
- ❖ Product recall strategy and market complaints redressed system.
- ❖ Advertisement and marketing channels in organized and unorganized sectors.
- ❖ Logistic management of milk and milk products.
- ❖ Recent trend in marketing and utilization of dairy products.

UNIT – IV : **11**

Co-operation :

- ❖ Definition and principle of cooperation – History and prospects.
- ❖ Structure of Dairy Cooperatives : Village level cooperatives, Taluka/District/Milk unions and state level marketing federation and their organization set up.
- ❖ Rights and duties of the chairmen, secretary and general body of the cooperative society.

Reference Book :

- ➢ Economics of dairy Farming in India-Ramkrishnappa V.
- ➢ Economics of milk marketing- Shojilal
- ➢ Dairy Farm business management-P.V. Rao
- ➢ Principles of dairy management- P.V.Rao

Semester – IV
Packaging and Quality Assurance

Paper –XVI

Total Period : 45

Periods Per week : 04 **Credits : 04**

Objectives :

- To know the utilities of packaging necessary for dairy industry.
- To study the various packaging materials for milk and milk products.
- To know the trends in packaging materials in dairy industry.
- To know the importance of quality assurance in dairy sector.

Unit – I : **10**

- Objectives of packaging.
- Packaging material used in dairy industry.
- Packaging of milk and it's types. Bottle capping and packaging, Tetra packs, cans, cones etc.
- Packaging of milk products.

Unit – II : **10**

- Study of form, fill and seal machines (Polypacks)
- Automation in packing of milk
- Automation in packing of different milk products.
- Recent trends in packaging materials used in dairy industry.

Unit – III : **11**

- Enrichment of shelf life of indigenous dairy products by the application of modern processing and packaging techniques.
- Sensory evaluation of Indian dairy products.
- Nutritional significance of unlue added dairy products.
- Reuse of packages, recycling of packaging materials and disposal of used packages.

Unit – IV :	**14**

- ❖ Strategies for globalization of Indian dairy products.
- ❖ 3-A sanitary standards for the hygienic packaging of milk and milk products.
- ❖ HACCP for dairy industry and International food laws.
- ❖ ISO standards and quality of dairy products.
- ❖ International food safety and Quality system certification.
- ❖ Prevention of food adulteration act and rules.
- ❖ FSSAI (Food safety standards Authority India) Regulation in dairy industry.
- ❖ Crime and punishment for adulteration in milk and milk products.

Reference Books:

- ❖ Quality Assurance monograph SMC College of Dairy Science of Anand.
- ❖ ISI bulletin for analysis of milk and milk products – BIS publication.
- ❖ PFA and MMPO Handbook.
- ❖ Testing of milk and milk products – Atherton and Newlendor.
- ❖ Text book Dairy Chemistry – B. R. Ling.
- ❖ Food safety and standards Act 2006. Rules and Regulation – 2011 – P.M. Kulkarni
- ❖ Packaging Bulletin
- ❖ Handbook of pollution control management – Hurburt F. Bund.

Semester – IV
Dairy Microbiology - II
Paper –XVII

Total Period: 45

Periods Per week: 04 **Credits: 04**

Objectives :

- To know the microbiology of Indigenous milk products, western dairy products and by products
- To know microbiological standards for milk and milk products.

Unit – I : **11**

- **Microbiology of Indigenous dairy products.**
- Microbiology of khoa, Rabri, Basundi, Channa, Paneer, Kulfi etc.
- Microbiology of sweetmeats : Pedha, Burfi, Gulabjamun.

Unit – II : **12**

- **Microbiology of western Dairy products.**
- Microbiology of cream, Butter.
- Microbiology of dialed milks : WMP, SMP and formula foods, conversed milk.
- Microbiology of cheese.
- Microbiology of Ice-cream of other frozen products.

Unit – III : **11**

- **Microbiology of Dairy By products.**
- Microbiology of whey.
- Microbiology butter milk
- Microbiology of casein
- Microbiology of Ghee residue.

Unit – IV : **11**

- **Microbiological standards**
- Microbiological standards for milk and milk products. BIS standards.
- USDA / FDA standards, UK standards, USPHS, APHA Standards.
- ICMFS, IDF / ISO / AOAC standards.

Reference Books :

- Dairy microbiology I & II – R. K. Robinson
- Compressive dairy microbiology – Yadav, Batish and Grover.
- Fundamentals of Dairy microbiology : J. B. Prajapati
- Testing of milk and milk product : Artheton and Newlender

Semester – IV
Dairy Science
Theory Paper - XVIII
Dairy Plant Management

Total Period: 45

Period per week – 04 **Credits: 04**

Objectives:

i) To study the principles & functions of Dairy Plant Management.

ii) To know the various ways and means of plant maintenance.

iii) To know the recent concept in the production management and food hygiene.

iv) To study the dairy plant design and types of dairy plant layout.

v) To study the process of sanitations and dairy waste disposal.

UNIT – I: **12**

General Dairy Management :

- Management and Administration.
- Personal management, manpower planning, recruitment, training, transfer, promotion policies, job specifications, job evaluation, job enhancement, job enrichment, MBO.
- Entrepreneurship Development.
- Entrepreneurial opportunities in India Dairying.
- Industrial legislation in India, particularly in dairy industry and statutory requirement for dairy industry-FSSAI, ISO-9001, ISO-22000, ISO-14000, ISO-50000, HACCP, GMP, GHP, CAC, etc.

UNIT – II : **11**

Plant Design:

- Types of plant layout, location of plant and selection of sites.
- Maintenance of dairy plant flooring and drainage lines, water supply, boiler house, service lines for electricity, water, steam and refrigeration.
- Dairy Equipment maintenance, plant maintenance and efficiency factors.
- Food hygiene, personal hygiene, plant hygiene, etc.

UNIT – III : **11**

Plant Management :

- ❖ Principles and functions of production management, product planning and control.
- ❖ Work study and measurement motion and time study, production efficiency and factors losses, personnel management.
- ❖ Material losses of dairy plant and hazardous processes.
- ❖ Uses of common lubricants (Food grade).

UNIT – IV : **11**

Cleaning, Sanitation and Dairy Waste Disposal :

- ❖ Different types of detergent and sanitizers required for cleaning in dairy industries.
- ❖ Cleaning in place and its types.
- ❖ Present trends in cleaning and sanitation in dairy plants i.e. Bio Detergents, ultrasonic technique, etc.
- ❖ Types of Dairy waste from different sections, waste treatment: primary and secondary treatment.
- ❖ RO-Technique for waste disposal, wastes recycling, etc.

Reference Book:

- ➢ Dairy plant design and layout.- Sunil M. Patel and A.G. Bhadania
- ➢ Dairy plant management and pollution control.- V. Vijaya Geetha
- ➢ Dairy Plant-Management and Engineering -Tufail Ahemad
- ➢ Technology of Dairy Plant Operation -K.P.S. Sangwan
- ➢ Dairy plant Management - D.B. Puranik

Semester -IV
Dairy Science
Theory Paper - XIX
Heritage Dairy Products of India

Total Period : 45

Period per week – 04 **Credits : 04**

Objectives :

i) To get acquainted to regional Indian milk products.

ii) To study their method of production, and nutritive value.

UNIT – I : **12**

- **Eastern regional milk products:** Pantooa, Rabari, Khir-mohan, Chana Murki, Chamcham, Channapoda, Bandal Cheese, Mistidoi, Rajbhog, Kamalbhog, Chhanapodo, Sandesh, Panir, Soft cheese, Rasomalai.

UNIT – II : **11**

- **Western regional milk products**: Lal-mohan, Ghewar, Surtipaneer, Ujani Basundi, Gangakher Kalam, Kunthalgiri Peda, Khoajilebi, Khurchan, Cham-cham.

UNIT – III : **10**

- **Southern regional milk products:** Dharwad Peda, Thirttural, Kunda Phirni, Paysum, Jilli, Mohandas, Kulfi, Shrikhandwadi.

UNIT – IV : **12**

- **Northern reginal milk products:** Kalajam, Kurchan, Bal-mithai, Lauki Kheer, Sohan Halwa, Lauki Ka Halwa, Padusha, Lucknowpeda, Agrapetha, Milk Cake, Pal-payasam.

Reference Book :

i) Technology of Indian milk products – P.R. Aneja, B.N. Mathur, R.C. Chandan.

ii) Handbook of milk processing Dairy products and packaging technology – EiRi Board..

iii) Milk and milk products Technology – M. Raziuddin and Ashok Hembade.

iv) Milk processing and Dairy products Industries – EiRi Board of Consultants and engineer.

v) Technology advances in Indigenous milk products – Dr. J. David

M.Sc. II Year.
(Practical based on paper XI & XVI)
Laboratory Course Work - 05

One Practical of 3 Periods per week **Credits : 04**

Practical's

Engineering Materials

1. Workshop study
2. Layout for different types of dairy plants
3. Study of flow patterns
4. Study of Pumps (Reciprocating, non- reciprocating, gear, pump, instant pumps) with their components, installation and working.
5. Study of Valves
6. Study of pipe fittings
7. Study of compression, refrigeration system
8. Study of refrigerant
9. Study of Boiler, Types, Components, and working study of Boiler fuels
10. Water softening treatment for boiler use
11. Study of evaporators
12. Study of Driers
13. Study of compressors and humidifiers
14. Study of process equipments: Chillers, Filters and clarifiers, Separators, Pasteurizers, Homogenizer
15. Butter churners and accessories.
16. Storage tanks and milk silos.
17. Packaging materials.
18. Bottle, Packaging, Capping, Polypack.
19. Study of can washers.
20. Study of bottle and crate washers.
21. Study of CIP system.
22. Visits to processing plant: Engineering workshop, Boiler unit, Refrigeration unit etc.

M.Sc. II Year

Dairy Science

(Practical Based on theory paper- XII

& XVII) Laboratory Course - 06

1 Practical per Week : **Credit : 04**

Practical's :

1. Preparation of reagents.
2. Calibration of dairy glass wares.
3. Techniques adopted to sterilize glassware and media ingredients.
4. Various staining techniques used to study. Morphological characteristics of microorganisms.
5. Study of general and selective media.
6. Microbiological analysis of milk & milk products by qualitative methods (SPC and DMC).
   i. Cream
   ii. Condensed milk
   iii. Skim milk powder & whole milk powder.
7. Staining of Bacteria from milk.
8. Determination of yeast and mold count in butter.
9. Evidence of staphylococci and coliforms in milk products.
10. Study of spoilage type and pathogenic organisms associated with milk & milk products.
11. Identification and maintenance of microbial cultures.
12. Propagation and preservation of dairy starters.
13. Preparation of yoghurt, kefir, acidophil as milk and kumiss.
14. Microbiological analysis of air, water and soil.
15. Rinse and swab techniques.
16. Field visits: Vidhya Dairy, Ananad.

M.Sc. II Year

Dairy Science

(Practical Based on Theory

paper XIII & XVIII)

Laboratory Course : 07

One Practical per week **Credit : 04**

Practical's

1. Study of working process of Co-operative Dairies.
2. Preparation of organizational charts.
3. Preparation of inspection schedule and inspection charts.
4. Study of maintenance of cold store and calculation of cooling load.
5. Study of various dairy plant equipments and their maintenance.
6. Study of Demand and supply schedule
7. Preparation of detergent & sanitizer solutions of desired strength.
8. Study of repairs and overhauls.
9. Study of effluent treatment plant.
10. Preparation of balance sheet.
11. Estimation of BOD in dairy effluent.
12. Estimation of COD in dairy effluent.
13. Study of condensing and vacuum pan.
14. Study of conveying systems in dairy plant.
15. Students visits to:

    i.Maintenance department of dairy plant.

    ii.Workshops

    iii.Modern Dairy plant.

DAIRY SCIENCE

List of Refereed, Peer reviewed and Indexed Journals with ISSN No

01	Journal of Food Science of Technology	:	ISSN 0022-115
02	Asian Journal of Dairy & Food Research	:	ISSN 09760563
03	The biosphere	:	ISSN 22517677
04	Journal of Animal production Advances	:	ISSN 2251-7219
05	Journal of Animal Science Advance	:	ISSN 1811-9751
06	International Journal of Dairy Science	:	ISSN 1557-4571
07	American Journal of food Technology	:	ISSN 2141-2448
08	International Journal of Livestock production	:	ISSN 1996-0794
09	African Journal of food science	:	ISSN 09715436
10	Indian Journal of Dairy and Bioscience	:	ISSN 22517685
11	Journal of Veterinary Advances	:	ISSN 09788988
12	Veterinary would (International Journal)	:	ISSN 0972-8988
13	Journal of Dairy Science	:	ISSN 0022-0302
14	Karnataka Journal of Agricultural Sciences	:	ISSN 13006045
15	American, European Journal Agricultural & Environmental Science	:	ISSN 18186769
16	New Zealand Journal of Dairy Science & Technology	:	ISSN 00288268
17	International Journal of Dairy Technology	:	ISSN 14710307
18	Journal of food science	:	ISSN 17503841
19	Asian Resonance	:	ISSN 0976-8602
20	International Journal of Food science and Technology	:	ISSN 13652621
21	Food science and Biotechnology	:	ISSN 20826456
22	Food Science and Nutrition	:	ISSN 248-7177
23	Emerald Nutrition and food science	:	ISSN 00346659
24	Dairy Science and Technology	:	ISSN 19585586

25	Italian journal of Animal Science	:	ISSN 15944077
26	Japanese journal and veterinary research	:	ISSN 00471917
27	Indian veterinary Journal	:	ISSN 0019-64799
28	Indian Journal of Animal Nutrition	:	ISSN 0970-3209
29	Patron	:	ISSN 09762310
30	International Journal of Agriculture innovations and Research	:	ISSN 2319-1473
31	Indian Dairyman	:	ISSN 0019-4603
32	Indian Journal of Dairy Science	:	ISSN 0019-5146
33	Animal Nutrition and Feed Technology	:	ISSN 0972-2963
34	Asian Journal of Microbiology, Biotechnology	:	ISSN 0972-3005
35	National Journal of life Sciences	:	ISSN 0972-995X
36	Asian Academic Research Journal of multidisciplinary	:	ISSN 2319-2801
37	Periodic Research	:	ISSN 2231-0045
38	Journal of International Research for multidisciplinary (Impact Factor : 1.393)	:	ISSN 2320-5083
39	Golden Research Thoughts (Impact Factor : 1.2018)	:	ISSN 2231-5063
40	Indian Streams research Journal (Impact factor : 0.2105 (GISI)	:	ISSN 2230-7850
41	Review of Research Journal (Impact Fact : 1.6672 (UIF)	:	ISSN 2249-894X

Dr .A.S. Hembade
Chairman
(Board in Dairy Science)