

**NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY, ADHARTAL
JABALPUR-482004 (MADHYA PRADESH)**

NOTIFICATION

No.2145/BOM/Reg/2021

Date: 08/10/2021

**RULES FOR AFFILIATION OF PRIVATE DAIRY TECHNOLOGY DIPLOMA
COLLEGE OFFERING TWO YEAR DAIRY TECHNOLOGY DIPLOMA (2021)**

Chapter I

Preliminary

1. Short title extent and commencement
 - a. These rules may be called Rules for affiliation of private Dairy Technology Diploma College offering two years Dairy Technology Diploma.
 - b. These shall extend to all private institutions who intend to affiliate or are affiliated (annual provisional or permanent, as the case may be) with Nanaji Deshmukh Veterinary Science University offering Dairy Technology Diploma located anywhere within the whole State of Madhya Pradesh.
 - c. These shall commence with effect from the date of notification.

2. Definitions-In these rules, unless the context otherwise requires,-
 - a. "Academic Council" means the Academic Council of the University;
 - b. "Affiliation" means a College or an Institution, whether private or public, by whatever name called, affiliated (annual provisional or permanent, as the case may be) with the University with respect to specific academic programmes;
 - c. "Board" means Board of Management of the University;
 - d. "College/Institution" means any College or Institution affiliated to the University providing Dairy Technology Diploma of the University;
 - e. "Faculty" means Faculty of the College/Institution/University;
 - f. "Government" means the State Government of Madhya Pradesh;
 - g. "Prescribed" means prescribed under these Rules;
 - h. "Principal" means head of an Affiliated College or Institution,
 - i. "Registrar" means the Registrar of the University;
 - j. "Student" means the person admitted and enrolled in an Affiliated College or institution of the University for taking a course of Dairy Technology Diploma;
 - k. "Teacher" means a person, known by any rank, appointed/hired by the Affiliated College or Institution for the purpose of imparting instruction;
 - l. "University" means Nanaji Deshmukh Veterinary Science University, Jabalpur.
 - m. "Vice-Chancellor" means the Vice-Chancellor of the Nanaji Deshmukh Veterinary Science University, Jabalpur

Chapter II

Introduction

1. As provided under the Madhya Pradesh Act No. 16 of 2009, Act No. 32 of 2012 and Amendment Act of No. 15 of 2019 the Nanaji Deshmukh Veterinary Science University (NDVSU) under its functions has been prescribed to affiliate Colleges /Institutions.

Therefore, in order to streamline the process of affiliation as well as to provide strict and appropriate guidelines so as to maintain standards of education, these rules are being promulgated.

2. Before approaching the University for Affiliation, the Society/Trust should carefully read the prospectus of the University provided for Dairy Technology Diploma, as fulfilling the norms, as required in regulations, before the affiliation and thereafter, shall be the sole responsibility of the Applicant Body.
3. It is advised that before approaching the University for Annual Provisional Affiliation, the Applicant Body should have duly appointed a professional as a Principal of the proposed College/Institution so that interactions on technical matters can be done with the Principal for better understanding of technical matters.
4. University shall not be responsible for any kind of delay in affiliation.
5. The University shall be providing Annual Provisional Affiliation to a College/Institution till it does not fulfill the requirements of Permanent Affiliation as mentioned in subsequent sections.
6. Any College/ Institution on Annual Provisional Affiliation shall be authorized to mention the status in the form of “*With Annual Provisional Affiliation of NDVSU*” on their signboards, letterheads, properties and other such documents.
7. Till a College/Institute is permanently affiliated to the university as provided in these rules, the College/Institute shall not be authorized to declare its status anywhere as “*Affiliated to NDVSU*”. This is being prescribed in public interest and correct status depiction to the students.
8. These rules are complimentary to the provisions *in vogue* or made in future by regulatory bodies like Controlling Body etc. By no means, these rules shall be overriding the provisions laid down by such bodies.

Chapter III

General rules

1. It shall be mandatory for the existing as well as future institutes to abide by these Rules. Existing Annual Provisionally Affiliated Colleges/Institute(s) shall fit in these rules automatically, depending upon the stage in which they are currently running. They will have to switchover to these provisions immediately.
2. Once, any institute is given Annual Provisional Affiliation, it shall be mandatory for that Institute/College to implement the directions/advice of the University, failing which, such Institute/College shall be inviting penalty, which may be financial, disallowing future admissions and/or stoppage of affiliation.
3. Only those Bodies/Trusts/Societies, which have been provided permission/NOC for opening a College/Institute by the Government of Madhya Pradesh for providing 2 years post 10+2 Dairy Technology Diploma shall be eligible to apply first for Annual

Provisional Affiliation to the university for Dairy Technology Diploma. **The NOC is only an in-principle permission of the state government to approach NDVSU for affiliation and does not confer any legal right on any institution to be affiliated to the University unless it is found to be fulfilling all the eligibility conditions prescribed for such affiliation.**

4. It shall be the sole responsibility of the Applicant Body/Affiliated College to satisfy the requirements of the programme. The University shall not be responsible for any legal and financial liabilities arising out of the matters connected with the Applicant Body/Affiliated College/Institutions. The University shall also be not liable for any sort of (full or part) compensation regarding any matter pertaining to any party including students and or staff etc.
5. Annual Provisional Affiliation shall be for the academic purposes only. The applicant body/College shall be bound to follow all directives of the Government/Department of Animal Husbandry/University etc.
6. The applicant body shall apply on the '*Prescribed application form*' having an enclosed self declaration on a Non-Judicial Stamp paper of **Rs. 1,000/- (Rupees One thousand only)** regarding facilities developed by the Applicant Body as per prescribed norms and growth plan.
7. If at any time during the continuation of Annual Provisional Affiliation, the Government/University raises any objection regarding adequacy of facilities, it shall be mandatory on the part of the College/Institute to fulfill the same in the prescribed time bound manner.
8. Any punitive/suggestive/advisory action by the Government of Madhya Pradesh/Department of Animal Husbandry/ University shall be binding to the Institute/College.
9. The University may appoint such number of Visitors or Inspectors, as it may deem requisite, to inspect any Annual Provisional Affiliated College/Institute or to attend any examination or any other affair as the University deems fit. The visitors shall not interfere with the conduct of any training or examination, but shall report to the Vice-Chancellor on the adequacy of the standards including staff, equipment, accommodation, training and other facilities as prescribed. The report of the Visitor(s) shall be treated as confidential unless in any particular case the Vice-Chancellor otherwise directs.
10. The University shall be empowered to institute an enquiry into the affairs related to academics/admissions/any other matter, of the College/Institute, for which it shall be mandatory to provide required information and cooperation.
11. In one district only one Private Dairy Technology Diploma College will be granted affiliation.

Chapter IV

Annual Provisional Affiliation for new colleges for admission

1. The prescribed application form shall be made available at a charge of **Rs.5,000/- (Rupees Five Thousand only)** non refundable as Application Form Charges, to those applicants who have been provided NOC by the Government of Madhya Pradesh. The person/body requiring application shall have to apply on the letter head and official seal

of the body to which NOC has been provided by the Government of Madhya Pradesh along with an attested copy of the NOC.

2. Application for Affiliation shall be in the prescribed format along with Non-Refundable Processing Fee of **Rs.50,000/- (Rupees Fifty thousand only)**. This application shall be valid for, only forthcoming academic session. If the applicant fails to obtain affiliation of the University, it shall have to apply afresh for the next session, by obtaining fresh prescribed application form and depositing application fee along with filled application form. The duly filled application submitted from 1st August to 31st December every year will only be accepted for admission in next academic session. Nevertheless, the University does not guarantee any time limit of process to the applicant.
3. Applicants should have submitted all the required documents to the Government of Madhya Pradesh as per the terms and conditions of the NOC, before applying for affiliation. They shall have to enclose a proof of it along with an attested copy of each document at the time of the application; otherwise, the application shall be rejected.
4. Incomplete application shall be rejected and fee forfeited, however, applicant shall be free to file fresh application.
5. The application fee shall be non refundable, even in cases of withdrawal of application, rejection of application and university deciding to not to grant affiliation.
6. When all the requirements are completely met, the management for the proposed College/Institute will file the application, make a presentation of the facilities to the University authorities, submit a video CD of the available facilities. If the facilities are seemingly inadequate, the Applicant Body shall be communicated so during the presentation and in writing also. In such a case, the Applicant Body shall develop adequate facilities and again make a presentation, with fresh video CD to the University authorities.
7. The University may decide such authorities, who shall be present at the time of presentation for recommending adequacy/otherwise to the university. The presentation shall be open to all faculty members of the university.
8. Consequent to presentation and viewing the video CD, if the University authorities are satisfied that the facilities developed by the applicant body are *prima facie* worth inspecting, the University shall send a team for inspection.
9. The Applicant Body shall have to deposit Non-Refundable Inspection fee of **Rs. 2.50 lakh (Rupees Two lakh fifty thousand only)** to the University.
10. The Inspection Team (as constituted by the university) shall visit the College/Institute after satisfactory presentation. The College /Institute shall extend all facilities and cooperation to the Inspection Team. The team shall submit the report to the Registrar for placing before the next Academic Council meeting
11. If the Academic Council approves, the report along with Academic Council's recommendation shall be put to the next Board meeting. Otherwise, it will be returned back to the Applicant Body of the proposed College/Institute for improving the facilities for re-inspection on a future date.
12. If approved also by the Board, the University shall issue orders of Provisional Affiliation, which shall be communicated to the Applicant Body within 4 weeks time from the approval by the Board.
13. After depositing of the prescribed Non-Refundable Initial Annual Affiliation Fee of **Rs. 6.00 lakh (Rupees Six lakh only)** in the shape of Bank Draft in favour of Comptroller,

- NDVSU, Jabalpur, the University will issue orders for Annual Provisional Affiliation.
14. The Applicant Body shall then submit a detailed status report along with request to the University.
 15. The Applicant Body will be required to complete staff recruitments as per norms and inform the University before providing admissions to new batch.
 16. The College/Institute shall tender a bank guarantee of **Rs. 30.0 lakh (Rupees Thirty lakh only)** as a surety and assurance of its financial capabilities before admitting students to the first year. The guarantee money shall be forfeited if the College/Institute fails to comply with the prescribed rules and regulations of the regulating body(ies).
 17. At the time of final inspection, the applicant body should ensure that all the required staff (teaching as well as non-teaching) has been recruited and present during the time of inspection, failing which, annual affiliation may be withdrawn, admission denied and the entire process of affiliation shall have to be started afresh.
 18. If the staff and other facilities are adequate as per norms, the University will give a letter for admitting the students for that particular session, provided that all foregoing conditions have been fulfilled.

Chapter V

Admission of students and subsequent Annual Provisional / Permanent Affiliation

1. The College/Institute shall not be able to admit students for a session without clear cut permission by the University. The admission of the students in the private affiliated College/Institute will be as per the norms set by the University for constituent College/Institute. The admission will be through University Counseling as per merit list of entrance test conducted by University or agency decided by University. There will be no Management quota.
2. There will be inspection every year by the University for Annual Provisional affiliation.
3. For getting permanent affiliation, consequent to fulfilling the conditions mentioned above to the satisfaction of the University but not before **05 years** of initial affiliation, subject to the Rules and Guide Lines of Controlling Body and/or NDVSU issued from time to time, the College/Institute shall be required to deposit one time permanent affiliation fee of **Rs. 30.0 Lakh (Rupees Thirty Lakh only)** in the shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur. This amount shall be Non-refundable. The amount shall be forfeited, in case the College/Institute fails to fulfill the minimum norms and requirements as per Nanaji Deshmukh Veterinary Science University, Jabalpur at an subsequent date. In such cases no students shall be allowed to be admitted to such College/Institute.
4. The university shall be free to take decision in consultation with the Government of M.P. regarding shifting of existing students of first year, when they come in second year (or during any subsequent year, as the case may be) to another college, as deemed fit, if the concerned College fails to develop adequate facilities for the second year as per the norms required by the University.
5. The affiliated College/Institute will have to pay Annual administration expenses 5.0 % of the total fee collected from all the enrolled students of each professional year to the university every year before the commencement of academic session.
6. Fee structure will be as decided by the University or prevailing fee structure in the university.

Chapter VI

Withdrawal of Affiliation

1. The Affiliation/Annual Provisional Affiliation granted to a College/Institute may be withdrawn or modified if the College/Institute fails to comply with any of the provisions/direction of affiliation specified by the University or Govt. of Madhya Pradesh at any stage of affiliation.
2. In case of finding deficiency, the University may also resort to reduction of intake capacity, to the level deemed fit, for one or more academic session.
3. The Inspectors/Visitors/any other person authorized by the University, while submitting their reports/communication to the University, points out any deficiency(ies)/violation of affiliation provision/non-compliance of directives of regulatory body/affiliating University, the University may impose financial penalty on the Institute/College. In such cases the University would advise the concerned Institute/College to rectify the deficiency/violation of provisions/compliance of directives in a stipulated time along with the payment of penalty. If Institute/College fulfill the above requirements in the stipulated time, University may depute the inspector/visitor/ any other person again, to verify the remedial measures, taken by the College/Institute.
4. The privileges conferred on a College/Institute by affiliation may be withdrawn in part or in full, suspended or modified, if the College/Institute on due enquiry, is found to have failed to comply with any of the provisions of the Act / Statutes, the Ordinances, the Rules and Regulations or any other direction or instruction of the University, or failed to observe any of the conditions of affiliation, or has conducted itself in a manner prejudicial to the academic and administrative standards and interests of the University.
5. When an affiliated College/Institute ceases to function or is shifted to a different location or is transferred to a different Society, Trust, individual or a group of individuals without the prior approval of the University, the affiliation granted to the College/Institute shall lapse automatically. Thus under such condition shifting or transfer, as the case may be, it shall be treated as a new College/Institute for the purposes of future affiliation.
6. The University on its own, on the basis of any complaint or any other information or report from any other source, can institute an enquiry in respect to a College/Institute, and after giving the College/Institute a reasonable opportunity of being heard, may pass an order prohibiting such College/Institute from presenting any student then undergoing such specified course / programme of study therein to the University for the award of the concerned Diploma in this case.
7. In cases where the Institute/College does not fulfill the requirements or remedial measures taken are not adequate, the University may submit the report of such Institute/College to the Academic Council, recommending withdrawal of affiliation of the Institute/College.
8. The decision of Academic Council would be put up before the Board of Management for further approval.
9. The Board of Management, before providing approval for withdrawing, may, if deemed necessary, provide a hearing to the College/Institute concerned.
10. If the Board of Management intends to withdraw affiliation of Institute/College, the university shall inform the Government that the Institute/College has failed to honour the

terms and conditions laid down by the Government in its NOC and therefore, shall further request to the Government to withdraw the NOC issued to the College/ Institute.

11. The College/Institute shall be deemed to be de-affiliated consequent to withdrawal of NOC by the State Government.
12. The University reserves the right to amend the rules/procedures/fee(s), related to affiliation of College(s)/Institute(s), in future without prior information to the College(s)/Institution(s).

Submission of form for fresh affiliation
(To be submitted in person or by Speed Post only)

From

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To

The Registrar,
Nanaji Deshmukh Veterinary Science
University, Jabalpur -482004

Dear Sir,

I have the honour to apply for Annual Provisional Affiliation to Nanaji Deshmukh Veterinary Science University for the College/Institution, viz., (Mention here the name of the proposed College/Institution)
.....proposed to be started at the place
..... in the year. for
Dairy Technology Diploma. The duly filled proforma is enclosed herewith for your perusal and consideration.

I hereby enclose the requisite application fees in the form of Bank Draft of ` (Rupees only) vide DD No. dated drawn on the (Name of the Bank) in favour of the “Comptroller, Nanaji Deshmukh Veterinary Science University, Jabalpur” payable at Jabalpur.

Signature

Place.....

Date.....

NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY, JABALPUR
APPLICATION FORM FOR GRANT OF AFFILIATION TO PRIVATE DAIRY
TECHNOLOGY DIPLOMA COLLEGE FOR ADMISSION TO DAIRY
TECHNOLOGY DIPLOMA

1.	Institution Detail		
	a)	Name of the Institution/ Collegeseeeking affiliation	
	b)	Place	
	c)	Address	
	d) i)	Telephone	
	ii)	Fax	
	iii)	E-mail	
2	Management		
	a)	Management of Trust or Society	
	b)	Whether registered under Societies Act. If so, the Registration No. (Attach true copy of the certificate of registration)	
	c)	Resolution of the Managing Committee for opening of New College (Attach copy)	
	d)	Constitution and Composition Managing Committee (supply copy of Constitution).	
	e)	Names and addresses along with photographs of the office bearers of the management committee {duly verified by the Tehsildar/Revenue Officer (President and Secretary)}	
3	Area/Accommodation of Institute/ College with details		
4	Particulars of the College/Institution		
	i)	Whether it is Diploma/Degree or Post Graduate Institute/College	
	ii)	Co-education or Boys/Girls Institute / College	
5	Course(s) for which affiliation is being initially sought		Dairy Technology Diploma
	i)	Faculty Course	All the courses essential for the award of Diploma

	ii)	Classes	1 st and 2 nd year
	iii)	Subject	As per university syllabus
6	Academic year from which affiliation is sought.		
7	Finance		
	a)	Total deposit with the Institute/College	
	b)	Source of Income	
	i)	Immovable/Movable property	
	ii)	Any other source, specify	
8	Building		
	a)	Total Area (with exact area and building plan)	
	b)	Accommodation available with Dimensions (ownership rights of land/ buildings and blue prints to be attached)	
9.	Minimum Standards requirement (Refer Annexure-IX)		
	a)	Common facilities	
	b)	Section wise facilities	
	c)	Other facilities	
	d)	Staff Strength	
	e)	Equipment	
	f)	Furniture, Fixtures and miscellaneous	
10	Any other information which is not covered in the proforma, yet considered important		

Signature of the Applicant

Dated:

Place:

UNDERTAKING

On behalf of the educational trust/society managing _____
I _____ Son/Daughter of _____,
do hereby undertake that the particulars furnished above are correct to the best of my knowledge and belief. I further undertake that I shall abide by the conditions, rules and regulative measures imposed by the University/Government of Madhya Pradesh from time to time for granting permission/affiliation to establish and run this Institution/College.

Signature of the Applicant

Dated:

Place:

Note:

1. The terms & conditions mentioned at annexure I to IX are to be fulfilled for getting affiliation from the NDVSU.
2. The applicants shall be required to submit a prescribed declaration on a Non-judicial stamp paper of Rs.1000/- along with the application form as per format given at Annexure- VII.
3. All correspondence regarding affiliation shall be addressed to the Registrar, Nanaji Deshmukh Veterinary Science University, Jabalpur.
4. Cost of Application Form will be Rs. 5,000/- (Non-refundable).
5. Application Processing Fee Rs.50,000/- (Non-refundable) to be deposited with the application form.
6. The University shall have the right to revise the fee structure and other terms and conditions mentioned in Annexure I to IX.
7. All charges covered under these rules are Non-refundable and can be made by Online transfer/Draft/Cheque subject to its clearance.

**PROVISIONS/NORMS/PROCESS OF AFFILIATION OF PRIVATE
DAIRY TECHNOLOGY DIPLOMA COLLEGE IN MADHYA PRADESH FOR
IMPARTING TWO YEAR DAIRY TECHNOLOGY DIPLOMA COURSE**

The applicants after necessary approval from the Government will approach the State Veterinary University (NDVSU) for affiliation and have to give an undertaking on the following lines duly attested by the First Class Magistrate to abide by the guidelines of the Madhya Pradesh Government laid down for opening of a New Institute/College in the State of Madhya Pradesh in Private Sector:-

- a) The applicant (name)_____will abide by the guidelines of the Controlling Body / NDVSU regarding the establishment of new Institute/College for imparting Two Year Dairy Technology Diploma course.
- b) The applicant_____will abide by the Madhya Pradesh Government/NDVSU directions from time to time regarding the admission procedure, fee structure of the students to be admitted.
- c) The applicant_____will abide by the Madhya Pradesh Government Rules regarding necessary approval for buildings and follow the Madhya Pradesh Pollution Control Board guidelines.
- d) The applicant/organization of the Institute/College establishing in the State will abide by directions of the Madhya Pradesh Government/NDVSU to provide necessary record of the College to Inspection Team at the time of Inspection.
- e) I hereby declare that the said College/Institute (which has applied for affiliation) shall abide all the rules and regulations, orders, instruction etc. issued by the University and also framed by in the future, failing which the University reserves the right to withdraw the affiliation.

Signature of the applicant

Guidelines for opening of a New Private Dairy Technology Diploma College in the State of MadhyaPradesh for providing Two Year Dairy Technology Diploma Course

- 1 The College should procure the minimum land (6 acres) as per requirement for opening a College.
- 2 The College should deposit the annual affiliation fee with the University amounting to **Rs. 6.00 Lakh** (Non-refundable) in the shape of bank draft in favour of Comptroller, Nanaji Deshmukh Veterinary Science University, Jabalpur for fresh admissions annually for each batch.
- 3 Admission of students to the first year class will be restricted to 80 students only and shall be as per University Prospectus of respective year. Proportion of general and reservations to different categories will be according to the directives of the Government, any other controlling agency and the University prospectus (NDVSU), Jabalpur.
- 4 The College should appoint regular full-time teaching staff having requisite qualifications as laid down by NDVSU to conduct both theory and practical classes in the subjects prescribed.
- 5 The College should appoint the required adequate non-teaching staff for administrative and laboratory work.
- 6 The College should set up various facilities including laboratories and Museum as per requirement for the first year class and other teaching and training facilities like library, computer room, staff and students common rooms etc. The college should have attachments with dairy plants for students training.
- 7 The College should set up a library having adequate number of textbooks, reference books, other reading material and report for compliance to the University. The College should spend sufficient funds toward purchase of books.
- 8 The College should tender a bank guarantee of **Rs. 30.0 lakh (Rupees Thirty lakh only)** as a surety and assurance of its financial capabilities before admitting students to the first year. The guarantee money will be forfeited if the College/Institute fails to comply with the prescribed rules and regulations of the regulating body.
- 9 The College should make preparation for the course to be taught at the III and IV semesters in terms of space/staff/laboratory/dairy plant and other programmes within one year.
- 10 The applicant should take urgent steps to construct its own building before start of the admission process.
- 11 The College should have its local managing committee.

General norms prescribed by NDVSU to be followed by the applicant body and affiliated College(s) (The provisions mentioned herein under, shall come in force with immediate effect)

- 1 Once, any College/Institute is affiliated, it shall be mandatory for that College/Institute to implement the directions/advice of the University, failing which, such College/Institute shall be inviting penalty, which may be financial fine, disallowing future admissions and/or stoppage of affiliation.
- 2 Only those bodies/trusts/societies which have been provided permission/NOC for opening a College by the Govt. of Madhya Pradesh, shall be eligible to apply for affiliation to the University. The NOC is only an in-principle permission of the state government to approach NDVSU for affiliation and does not confer any legal right on any institution to be affiliated to the University unless it is found to be fulfilling all the eligibility conditions prescribed for such affiliation.
- 3 It shall be the sole responsibilities of the applicant body/affiliated College/Institution to satisfy the requirements of Government of Madhya Pradesh/Controlling Body/NDVSU. The University shall only be acting as facilitator, without any legal and financial liabilities arising out of the matters connected with the applicant body/affiliated college.
- 4 Affiliation shall be for the academic purposes only. The applicant body/College shall be bound to follow all directives of Government of Madhya Pradesh/Controlling Body and /or NDVSU.
- 5 The applicant body/College shall be bound to respond to the provisions of RTI Act, so far as connected to the matters of affiliation with University.
- 6 If at any time during the continuation of affiliation, the Government of Madhya Pradesh/Controlling Body/NDVSU raises objections, it shall be mandatory on the part of the College to fulfill the same.
- 7 Any punitive/suggestive/advisory action by the Government of Madhya Pradesh/Controlling Body/NDVSU shall be binding to the College and University affiliation or any other action shall not override the issues raised by the Government of Madhya Pradesh / NDVSU.
- 8 The University may appoint such number of visitors as it may deem necessary to inspect any affiliated College or to attend any examination held by any such College or any other affair as the University deems fit. The visitors shall not interfere with the conduct of any training or examination, but shall report to the Registrar/Vice-Chancellor on the adequacy of the standards including staff, equipment, accommodation, training and other facilities prescribed by the Controlling Body and NDVSU, Jabalpur. The report of the visitor(s) shall be treated as confidential unless in any particular case the Vice- Chancellor otherwise directs.
- 9 The University shall be empowered to institute an enquiry into the affairs related to academics/admissions/affiliation matters/any other, of the affiliated College, for which it shall be mandatory for the affiliated institutes to provide required information and cooperate.

Procedure of applying for provisional Affiliation

1. The prescribed application form shall be made available at a charge of **Rs. 5,000/-** (Non-refundable in the shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur, to those applicants who have been provided NOC by the Government of Madhya Pradesh for opening of a new Private Institute/College. The person/body requiring application shall have to apply on the letter head and official seal of the body to which NOC has been provided by the Government of Madhya Pradesh along with an attested copy of the NOC.
2. Application for affiliation shall be in the prescribed format along with application processing fee of **Rs.50,000** (Non-refundable) in the shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur. This application shall be valid for only forthcoming academic session. If the applicant fails to obtain affiliation of the University/permission from Government of Madhya Pradesh to start the Institute/College in that particular session, it shall have to apply afresh for the next session, by obtaining fresh prescribed application form and depositing application processing fee.
3. Applicants should have submitted all the required documents to the Government of Madhya Pradesh as per the terms & conditions of the NOC, before applying for affiliation along with proof. Otherwise, the application shall be rejected.
4. Incomplete applications shall be rejected and fee forfeited. However, applicant shall be free to file fresh application.
5. The application processing fee shall be non refundable, even in cases of withdrawal of application, rejection of application and University deciding to not to grant affiliation.
6. When all requirements for affiliation are completely met, the management for the proposed Institute/College will file the application, make a presentation of the facilities to the University authorities, submit a video CD of the available facilities and invite the inspection team of the University. The applicant body shall have to deposit an Inspection fee of **Rs. 2.50 lakh** (Non- refundable) to the University in the shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur for fresh admissions.
7. Consequent to presentation and viewing the video CD and depositing of Inspection Fee, if the University Authorities are satisfied that the facilities developed by the applicant body are prima facie worth inspecting, the University shall send a team for inspection. If the facilities are seemingly inadequate, the applicant body shall be communicated so during the presentation and in writing also. In such a case, the applicant body shall develop adequate facilities and again make a presentation, with fresh video CD to the University Authorities.
8. The University may decide such authorities, who shall be present at the time of presentation for recommending adequacy/otherwise to the University.
9. The Inspection team (as constituted by the University) shall visit the College after satisfactory presentation and receiving invitation letter. The team shall submit the report to the Registrar for placing before the next Academic Council meeting.
10. If the Academic Council approves, the report along with Academic Council recommendations shall be put to the next Board of Management (BOM) meeting. Otherwise, it will be returned back to the applicant body of the proposed Institute/College for improving the facilities and re- inspection on a future date. If approved also by the BOM, the University shall issue orders of provisional affiliation which shall be communicated to the applicant body within 4 weeks.

Affiliation and Administrative Expenses to be paid by the concerned

Institute for fresh affiliation

1. The applicant body will be required to complete staff recruitments and inform the University.
2. After receiving permission from Government of Madhya Pradesh to start the College/admit the students, the applicant body having completed the recruitment process, it shall invite the University team for Inspection (as constituted by the University). The applicant body shall have to deposit an Inspection fee of **Rs. 2.50 lakh** (Non-refundable) to the University in the shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur for fresh admissions.
3. At the time of inspection, the applicant body should ensure that all the required staff (teaching as well as non-teaching) has been recruited and present during the time of inspection, failing which, affiliation may be denied and the entire process of affiliation shall have to be started afresh.
4. If the staff and other facilities are adequate, the University will give a letter for deposit of the affiliation fee of **Rs.6.00 lakh** annually till the permanent affiliation is granted by NDVSU. The payments will be made in shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur.
5. After deposit of the affiliation fee, the University will issue orders for its Affiliation.
6. **Annual administration expenses @ 5.0%** of the total fees paid by all the students enrolled in the institute shall be payable to the university by the institution every year before the commencement of academic session.
7. The College should tender a bank guarantee of **Rs. 30.0 lakh (Rupees Thirty lakh only)** as a surety and assurance of its financial capabilities before admitting students to the first year. The guarantee money will be forfeited if the College/Institute fails to comply with the prescribed rules and regulations of the regulating body.

Admission of students, subsequent annual affiliations and permanent affiliation

1. The College shall not be able to admit students for any academic session without clear cut permission of the NDVSU (if required) and subsequent grant of Annual affiliation by the University.
2. The admission of students in the College/Institute shall be strictly as per the procedure and guidelines given in the prospectus. The admission will be through University Counseling as per merit list of entrance test conducted by University or agency decided by University. There will be no Management quota.
3. There will be inspection every year by the University for Annual Provisional affiliation.
4. **Annual administration expenses @ 5.0%** of total fees paid by all the enrolled students shall be payable to the university by the institution every year before the commencement of academic session even after permanent affiliation.
5. For getting permanent affiliation, consequent to fulfilling the conditions mentioned above upto the satisfaction of the university but not before **05 years** of initial affiliation, subject to the Rules and Guidelines of controlling body and/ or NDVSU issued from time to time, the College shall be required to deposit one time affiliation fee of **Rs. 30.0 lakh** (Rupees Thirty lakh only) in the shape of Bank Draft in favour of Comptroller, NDVSU, Jabalpur. This amount shall be Non-refundable. This amount shall be forfeited, in case the College fails to fulfill the minimum norms and requirements as per Nanaji Deshmukh Veterinary Science University, Jabalpur at any subsequent date. In such cases, no students shall be allowed to be admitted to such institute.

GUIDELINES OF PERMANENT AFFILIATION

The College/Institute seeking Permanent Affiliation has to submit an application along with all supporting documents and payment of requisite inspection fee of Rs. 2.50 lakhs (Rs. 1.50 lakh for fresh admission and Rs. 1.00 lakh for existing professional year other than fresh admission) or as approved by the University from time to time. After scrutiny of application, Permanent Affiliation shall be granted by the University as per following guidelines:

1. The College/Institute shall have five years of standing.
2. The College/Institute shall have Faculty/Infrastructure as per University norms.
3. After inspection if the University is satisfied for granting Permanent affiliation, the College/Institute shall have to pay Rs. 30.00 lakh in the form of Demand draft (non-refundable). The amount shall be forfeited in case the College/Institute fails to fulfill the required norms and requirements as per NDVSU, Jabalpur at any subsequent date. In such case no student shall be allowed to be admitted to such College/Institute.
4. The University will inspect the College/Institute for the Course offered every Academic Year before the counseling process for admission and the College/Institute has to pay requisite

- inspection fee of Rs. 2.50 lakhs (Rs. 1.50 lakh for fresh admission and Rs. 1.00 lakh for existing professional year other than fresh admission) or as approved by the University from time to time
5. The Validity of Permanent Affiliation is 08 years and the College/Institute shall apply for renewal of Permanent Affiliation status after completion of 08 years by paying the requisite fee of Rs. 30.00 lakh.

DECLARATION
(TO BE PRODUCED ON Rs. 1,000/- NON JUDICIAL STAMP PAPER
ATTESTED BY NOTARY PUBLIC)

I.....S/O..... resident of
.....on behalf of
(Organization/trust/society) solemnly declare that:

1. I have applied for affiliation of institute (named below) for award of the Dairy Technology Diploma to Nanaji Deshmukh Veterinary Science University, Jabalpur on the prescribed form along with prescribed fee.

2. The details about the institute are given below:Name of Institution (in capitals letters)

(In English).....
.....

(In Hindi).....
.....

Complete Postal Address of the Institute (in capital letters)

(In English).....
.....

(In Hindi).....
.....

Institute phone numbers with STD code

Office..... Residence..... Fax.....

Mobile..... Email address (compulsory):.....

2.4.1 Name and complete postal address of controlling organization/trust/society (in capital letters)

(InEnglish).....
.....

(In Hindi).....
.....

Authorized signatory’s phone numbers with STD code

Office.....Residence.....

Fax.....Mobile.....

Email address (compulsory).....

Details of ownership rights of land and building and blue print are provided.

3. Detailed infrastructure facilities etc are given in Annexure entitled on its page - REQUIREMENTS FOR AFFILIATION OF A NEW COLLEGE/INSTITUTE FOR DAIRY TECHNOLOGY DIPLOMA INFRASTRUCTURAL PROVISIONS consisting of total.....pages, duly filled in on behalf of me.

4. On behalf of the Applicant Body, of which I am authorized declaring representative, I have full knowledge of the norms of the Govt. of Madhya Pradesh/NDVSU, Jabalpur.

5. On behalf of the Applicant Body, of which I am authorized representative, I am fully aware that the diploma programme, to which the Applicant Body, of which I am authorized declaring representative, has applied, is governed by the norms of the Government of Madhya Pradesh/NDVSU, Jabalpur.
6. On behalf of the Applicant Body, of which as authorized declaring representative, I declare that it shall be binding on the Applicant Body to fully, in letter and spirit, follow the norms of the Govt. of Madhya Pradesh/NDVSU, Jabalpur as laid down at present as well as in future.
7. On behalf of the Applicant Body, of which I am authorized declaring representative, I declare that it shall be binding on the Applicant Body to fully, in letter and spirit, abide by the guidelines/advises/directives etc. provided by the NDVSU/Govt. of Madhya Pradesh including their authorities.
8. On behalf of the Applicant Body, of which I am authorized declaring representative, I declare that it shall be binding on the Applicant Body fully, in letter and spirit, abide by the norms of affiliation as laid down at present as well as in future of the Nanaji Deshmukh Veterinary Science University, Jabalpur.
9. Details of management committee members along with verified address (by Tehsildar/ Revenue Officer) and their photographs are provided in Annexure 3.
10. I hereby declare that the said College/Institute (which has applied for affiliation) shall abide all the rules and regulations, orders, instruction etc. issued by the University and also framed by in the future, failing which the University reserves the right to withdraw the affiliation.
11. The above information in Para 1 to 10 is correct to the best of my knowledge and nothing, herein, has been concealed.

Annexure enclosed with it:

- | | |
|---|--------|
| a) Annexure 1: Prescribed format duly filled and signed | YES/NO |
| b) Annexure 2: Copy of ownership rights of land and building and blue print of the existing & proposed building. | YES/NO |
| c) Annexure 3: The details of management committee members along with verified address (by Tehsildar/ Revenue Officer) and their photographs. | YES/NO |

Signature

(Authorized signatory on behalf of organization/trust)

Date:

Place:

Witness 1:

Name:

Father's name:

Full Address:

Witness 2:

Name:

Father's name:

Full Address:

Financial Penalties to be imposed on College/Institutes for deficiencies

Penalties in the form of fine may be up to the following limits, as recommended by the Inspectors/Visitors/Authorized Persons.

<u>Items of Deficiencies</u>	<u>Amount in Rupees</u>
1. Building	60,000
2. Staff	60,000
3. Library	30,000
4. Equipments	30,000
5. General upkeep of the campus	15,000
6. Delayed submission of examination marks	15,000
7. Other deficiencies	As decided by the University

Imposition of penalty shall be subject to the recommendations in the Inspection Report and its approval by the Academic Council, which shall have a right to modify and/or wave off the recommended penalty also. Decision of the Academic Council shall be final in the matter. A warning letter will be issued to the College/Institute before imposing financial penalty.

Affiliation orders of applicant College/Institute will not be issued and admissions for the current year will not be made until the deficiencies pointed out by the inspection committee are met.

Minimum Standard Requirements

1. **Sections:** Each College/Institute shall have the following Sections under the administrative control of the Principal of the Dairy Technology Diploma College.

- a. Dairy Technology
- b. Dairy Engineering
- c. Dairy Chemistry
- d. Dairy Microbiology
- e. Dairy Business Management

2. **Land Requirement and Accommodation:** A minimum of 6 acres of land on long term lease or ownership in the name of Institution. In general the ratio of carpeted area and open (circulation) area in the campus should be 1:1.

a. **Common facilities:**

- | | | |
|-------|---|-----------|
| i. | Principal's office with attached toilet & retiring room | 500 Sq ft |
| ii. | Visitor's room | 300 Sq ft |
| iii. | Committee cum Seminar room | 600 Sq ft |
| iv. | Office (academic and budget section) | 300 Sq ft |
| v. | Record room | 150 Sq ft |
| vi. | Store | 300 Sq ft |
| vii. | Computer room | 300 Sq ft |
| viii. | Toilet facilities for visitors, staff and students | |
| ix. | Canteen | |
| x. | Library cum reading room with adequate seating accommodation, books, internet and photocopying facility | 450 Sq ft |
| xi. | Two lecture halls with a seating capacity for 60-100 students
1200 Sq ft each | |
| xii. | Play grounds with games and sports facilities | |
| xiii. | Drinking water facility | |
| xiv. | Hostel for boys and girls with common room, Mess etc. | |

b. **Section wise facilities:**

- | | | |
|------|---------------------------|----------------|
| i. | Dairy Technology: | |
| | 1. 2 Faculty rooms | 150 Sq ft each |
| | 2. One lab | 1200 Sq ft |
| ii. | Dairy Engineering | |
| | 1. 2 Faculty rooms | 150 Sq ft each |
| | 2. One lab | 1200 Sq ft |
| iii. | Dairy Chemistry | |
| | 1. 2 Faculty rooms | 150 Sq ft each |
| | 2. One lab | 1200 Sq ft |
| iv. | Dairy Microbiology: | |
| | 1. 2 Faculty rooms | 150 Sq ft each |
| | 2. One lab | 1200 Sq ft |
| v. | Dairy Business Management | |
| | 1. 2 Faculty rooms | 150 Sq ft each |
| | 2. One lab | 1200 Sq ft |

c. **Other facilities:**

Dairy Plant and Business Incubation Centre

Raw Milk receiving Dock, Milk storage tank room, Milk Processing Hall, Cheese Room, Milk Condensing & Drying Plant room, Cheese Drying & Curing room, Milk Cold Store, Ice Cream Hardening Room, Dispatch Dock, Milk pasteurization and packaging Room, Boiler House, Refrigeration & Ice Bank, System room, Store room – Products, Store room-chemicals & accessories, Sales Counter, Offices, Wash rooms.

3. Staff Strength

A Diploma College seeking affiliation with NDVSU should have following teaching and non teaching posts:

S. No.	Name of post	Number required
1.	Principal	01
2.	Assistant Professor	04
3.	Accountant	01
4.	Computer Operator/ Clerk	02
5.	Laboratory Technician	01
6.	Laboratory attendant	01
7.	Driver	01
8.	Peon/ Chowkidar	04

The basic qualification for the teaching staff should be B.Tech (Dairy Technology)

4. Equipments

S. No.	Name of Equipment	Qty
Dairy Technology		
1	Weighing Balance (200 kg)	01
2	Can Washer	01
3	Homogenizer	01
4	Pasteurizer (Batch)	01
5	Batch Sterilizer	01
6	Bulk Milk Cooler	01
7	Continuous Pasteurizer (HTST)	01
8	Cream Separator	01
9	Butter Churn	01
10	Ghee Kettle with accessories	01
11	Gerber Centrifuge	01

12	Ice cream preparation unit	01
13	Cheese Vat and Accessories	01
14	Cheese Ripening Cabinet	01
15	Packaging Machine For Milk	01
16.	Cup Filling and Sealing Machine	01
17.	Refrigerator	01
18.	Deep Freezer	01
19.	Khoa Making Machine	01
20.	Paneer Vat and Accessories	01
21.	Laboratory Spray Drier	01
22.	Laboratory Condensing Unit	01
23.	Miscellaneous Utensils, and Other Items	-
Dairy Engineering		
1	Refrigeration Tutor	01
2	Air-conditioning Tutor	01
3	Ice plant Tutor	01
4	Tubular Heat Exchanger	01
5	Shell & Tube Heat Exchanger	01
6	Plate Heat Exchanger	01
7	Thermal Conductivity Apparatus	01
8	Reynold's Apparatus	01
9	Radiation and Convection Apparatus	01
10	Electric Steam Boiler	01
11	Evaporator Model	01
12	Spray Dryer Model	01
13	LVDT Transducer	01
14	Instrumentation Tutor	01
15	Texture Analyzer TA-HD ⁺	01
16	Water Activity Meter	01

17	Digital pH meter	01
18	Thermocouple	01
Dairy Chemistry		
1	Electronic Balance	01
2	Hot Air Oven	01
3	Muffle Furnace	01
4	pH Meter	01
5	Viscometer	01
6	Kjeldahl Unit	01
7	Water Bath	01
8	Refrigerator	01
9	Gas (LPG+Stove)	01
10	Flame Photometer	01
11	Colorimeter	01
12	Magnetic Stirrer	01
13	Milko Scan	01
Dairy Microbiology		
1.	Autoclave	1
2.	Hot Air Oven	1
3.	Laminar Air Flow	1
4.	Incubator	1
5.	BOD Incubator	1
6.	Microscope	10
7.	Water Bath	1
8.	Refrigerator	1
9.	Deep Freezer	1
10.	Centrifuge	1
11.	Balance (1mg)	1
12.	Balance	1
13.	Distillation Unit	1
14.	Lovibond Color Comparator	1
15.	Vortex	1
16.	Colony Counter	1
17.	Magnetic Stirrer	1

Dairy Business Management		
1.	Computer System (Desktop)	20
2.	Furniture (Chairs and Tables for Computers)	20
3.	Projector	01
4.	Projector Screen	01
5.	Air Conditioner	01
6.	Printer	01
7.	UPS	01
8.	Internet Connection (ISP's, Rack, Switch, Cabling)	-
9.	Audio-visual Aids	-

5) Furniture, Fixture and miscellaneous

S. No.	Particulars	Requirement
1.	Laboratory Tables	60
2.	Lab Stool	120
3.	Desk & Bench	60
4.	Executive Table and Chair	01
5.	Office Table (Medium)	10
6.	Office Table (Small)	10
7.	Steel Almirah	15
8.	Meeting table	01 Set
9.	Chairs	100
10.	Book Case	10
11.	Library Table	06
12.	Library Chairs	20
13.	Computer Table	10
14.	Computer chairs	10
15.	Computer system with UPS	10
16.	Transport facilities	
	a. Bus	01
	b. Pickup Van	01

Summary of various non-refundable charges

S.No	Particulars	Amount (Rs.)
1	Cost of application form	5,000/-
2.	Application processing fee	50,000/-
3	Inspection fee	2.50 lakh
4.	Provisional Annual Affiliation fee (for both fresh admission and 2 nd year)	6.0 lakh
5	Bank Guarantee	30.00 lakh
6	Annual Administrative Expenses	The Affiliated College will have to deposit Annual Administrative Expenses 5.0% of the total fee collected from all the enrolled students of each professional year.
3	One time Permanent affiliation fee after five years	30.00 lakh

. Note: The fees/ charges etc. are non-refundable and liable to be changed by the University at any time.

DURATION OF DIPLOMA COURSE

The diploma course shall be of 2 years duration comprising of course work for three semesters and hands on training for one semester in final year.

QUALIFICATION FOR ADMISSION

Candidates for admission to this course should have passed 12th standard or its equivalent examination of a recognized Indian Board.

Candidate should have passed the examination in Physics, Chemistry, Mathematics and English as a core subject.

INTAKE

The intake shall be 80 per year.

FEE STRUCTURE

As decided by the University or prevailing fee structure in the Vishwavidyalaya.

ACADEMIC RULES

All other rules shall remain the same as prevailing in the Vishwavidyalaya for diploma courses.

ACADEMIC PROGRAMME OF DAIRY TECHNOLOGY DIPLOMA

DAIRY TECHNOLOGY DIPLOMA **Semester wise Distribution of Courses**

S.No.	I Semester	Course No.	Credit hours
1.	Introduction to Dairying	DX-111	2+0
2.	Physical Chemistry of Milk	DC-111	3+1
3.	Biochemistry & Human Nutrition	DC-112	2+1
4.	Economic Analysis	DA-111	1+1
5.	Introductory Dairy Microbiology	DM-111	3+1
6.	Environmental Studies	DS-111	1+1
7.	Market Milk	DT-111	3+1
	Total		21
	II Semester		
1.	Microbiology of Milk and Other Foods	DM-121	1+1
2.	Chemistry of Milk	DC-121	3+1
3.	Electrical Engineering	DE-121	3+1
4.	Market Milk Process Equipments	DP-121	1+1
5.	Fat rich and Indigenous Dairy Products	DT-121	3+1
6.	Cheese, Fermented Products and By-products	DT-122	1+1
7.	Condensed and Dried Milks	DT-123	1+1
	Total		20

	III Semester		
1.	Ice-cream and Frozen Dairy Products	DT-211	1+1
2.	Dairy Products Equipments	DP-211	1+1
3.	Chemical Quality Assurance	DQ-211	2+1
4.	Microbiological Quality Assurance	DM-211	3+1
5.	Extension Communication & Dairy Entrepreneurship Management	DX-211	3+1
6.	Chemistry of Milk Products	DC-211	3+1
7.	Financial Accounting	DA-211	1+1
	Total		21
	IV Semester		
	In-Plant Training	DX-221	0+25
	Total		87

Syllabus

Semester-I

Introduction to Dairying

Theory

Dairying: Genesis of Dairying, Dairy Education & Research in India, Importance of Dairying, Dairying in National and Global Context, Dairying in rural and urban scenario, Traditional v/s Commercial Dairying, Issues & challenges of dairy farming /Dairy Industry in India.

Dairy Development Programmes: Concept, Genesis and Initiatives of Dairy Development Programmes in India. Five year plans and dairy development in India. Past and Present Dairy Development Programmes. Dairy Development Institutions and Organisations, Dairy Cooperatives- Basic Principles, Structure and Functions.

Conceptual Orientation to Dairy Science Disciplines / Branches. Milk Production and Milk Processing, Milk Procurement and Milk Marketing, Dairy Industry, Structure and Functioning

Physical Chemistry of Milk

Theory

Constituents and gross composition of milk of different species and breeds of milch animals, Colloidal State : Distinction between true and colloidal solution, lyophilic & lyophobic solution, properties of colloidal system. Properties of colloidal systems, Gels- their formation and properties. Milk as a colloidal system and its stability. Elementary idea about emulsion. Density : Density and specific gravity, pycnometer method, hydrometer lactometer. Density and specific gravity of milk, effect of various processing variables on the density and specific gravity of milk. Liquid State : Surface tension, surface energy interfacial tension. Surface tension of mixtures. Surface tension of milk and the factors affecting it. Viscosity- Definition of viscosity, Newtonian and Non-Newtonian liquids, Stokes Law, influence of temperature and concentration of solute on viscosity. Viscosity of milk, evaporated milk and condensed milk. Refractive index. Colligative Properties of Dilute Solution : Vapour pressure, Raoult's Law, Depression of freezing point, Elevation of boiling point. Freezing point and boiling point of milk. Osmosis and Osmotic pressure. Inter-relation of colligative properties.

Aqueous solution of Electrolytes : Electrolytes ; non-electrolytes, ionic mobility, electrical, Ostwald Dilution Law, Kohlrausch Law, Electrical conductance of milk. Ionic Equilibria : Dissociation of water, ionic product of water, concept of pH and pOH and their scale. Acids and bases : Bronsted Lewis concepts of acids and bases, dissociation constants of acids and bases. Salt-their hydrolysis. Buffer solutions. Derivation of Henderson – Hasselbach equation and its application, buffer capacity and buffer index, milk as a buffer system. Equilibrium of electrolytes. pH indicators. Oxidation- Reduction : Redox potential, Nernst equation, electrochemical cells. Hydrogen, glass and calomel electrodes. Redox system of milk. Nuclear Chemistry : The nature of isotopes, radio isotopes. Half life period of radio isotopes. Some of the important radio isotopes. Occurrence of radio nuclide in milk & milk products. Molecular Spectroscopy : The spectrum of electromagnetic radiation, the laws of Lambert and Beer, visible, and ultra-violet Spectroscopy. Mention of mass, NMR spectroscopy.

Practicals

Determination of density and specific gravity of milk using pycnometer, hydrometer and lactometer. Determination of viscosity of milk using Ostwald viscometer. Determination of surface tension of milk using Stalagmometer. Interfacial tension between water-oil phase. Determination of freezing point of milk. Preparation of a buffer solution. Determination pH of buffer solution and milk electrometrically. Determination of acidity of milk electrometrically. Determination of electrical conductance of milk. Determination of redox potential of milk. Coagulation of milk using electrolytes. Determination of refractive index of skim milk and whey. Titration of amino acid in the presence and absence of formaldehyde. Determination of PKa1 PKa2 and PL. Verification of Lambert Beer Law.

Biochemistry & Human Nutrition

Theory

Biochemistry: Enzymes Ribozymes, isozymes, allosteric enzymes, zymogens, regulatory, Classification and mechanism of enzyme action, Factors affecting rate of enzyme catalyzed reaction, enzyme inhibition, Enzymes coenzymes and co-factors immobilisation of enzymes, Nucleic acids and Bioenergetics : Structure and function, definition and composition. Structure of RNA & DNA-Anabolism and Catabolism of carbohydrates, lipids and proteins. Vitamins and Hormones : Structure & functions, general description. Relationship between vitamins and hormones in terms of their biological role. Elementary knowledge of milk synthesis in mammary gland.

Human Nutrition: Theory and definition, Scope of Nutrition: Functions of the various nutrients in body. Digestion, absorption and assimilation of nutrients. Comparative requirements and nutritional requirement of different age groups. (WHO and ICMR standard) Methods of evaluation of nutritive value of foods Nutritional value of cow, buffalo and human milk. Milk intolerance: lactose deficiency and protein hyper sensitivity. Safety aspects of food additives, toxic elements, radionuclides, pesticides and antibiotic residues in milk and milk products. Institutional feeding of workers. Planning and implementation of national food and nutrition policies and programme. Regulatory aspects of nutrition, IDF code on nutrition, nutrition facts under NLEA, Nutrient descriptors, serving size and nutritional claims.

Practicals

Biochemistry Estimation of alkaline phosphatase and the effect of temperature and pH on its activity. Estimation of catalases and the effect of temperature and pH on its activity. Determination of the Michealis constant of an enzyme. Estimation of RNA by colorimetric method Estimation of DNA by colorimetric method. Measurement of proteolysis. Lipolysis, Amylase activity.

Estimation of vitamin 'A; in ghee. Estimation of ascorbic acid in milk. Estimation of vitamin D in milk. Estimation of proteins by Lowry's method. Biuret method. Estimation of Lipids and Lipids analysis by TLC. Estimations of cholesterol in milk. Estimation of denaturation of proteins in heated milk by dye binding method. Estimation of HMF content in food.

Economic Analysis

Theory

Basic concepts-wants, goods, wealth, utility, consumption, demand and supply. Consumer behaviour-law of diminishing marginal utility and equi-marginal utility, cardinal and ordinal utility approach for consumer's behaviours. Theory of demand-law of demand, demand schedule, demand function, determinates of demand, individual consumer demand and market demand, demand forecasting, elasticity of demand, price elasticity, income elasticity and cross elasticity, Consumer's surplus. Theory of production- concepts of firm and industry, basic factors of production and their role, production function for a single product, nature of production function, laws of returns. Concepts of costs-fixed and variable costs, short run and long run costs, average and marginal costs, economics and diseconomies of scale, break even analysis

Concept of market- types of market, pricing and output under different market situations, market price and normal price, price determination under perfect Competition, monopoly, oligopoly and monopolistic competition. Macro – Economics: National income – GDP, GNP, NNP, disposable personal Income, per capita income, inflation. Economic features and characteristics of dairy sector in India. Dairy development strategy with special emphasis in post- independence era and Operation Flood Programme

Practicals

Demand Schedule & Supply schedule. Law of diminishing utility. Production Function. Law of diminishing returns. Computation of elasticity's. Cost of milk production & processing. Computation of Depreciation. Break even analysis. Project Appraisal

Introductory Dairy Microbiology

Theory

Hygienic milk production system; microbial quality of milk produced under organized v/s unorganized milk sector in India and comparison with developed countries; microbial and non microbial contaminants, their sources and entry points in milk during various stages of production; Good Hygiene Practices (GHP) during milk production operations Microorganisms associated with raw milk; morphological and biochemical characteristics of important groups and their classification; significance of different groups of bacteria i.e. psychrotrophs, mesophiles, thermodurics, and thermophiles in milk. Microbiological changes in bulk refrigerated raw milk; Impact of various stages like milking, chilling, storage and transportation on microbial quality of milk with special reference to psychrotrophic organisms; Direct and indirect rapid technique for assessment of microbial quality of milk. Role of microorganisms in spoilage of milk; souring, curdling, bitty cream, proteolysis, lipolysis; abnormal flavors and discoloration. Mastitis milk: Processing and public health significance, organisms causing mastitis, somatic cells secreted in milk; detection of somatic cell count (SCC) and organisms causing mastitis in milk. Milk as a vehicle of pathogens; Food infection, intoxication and toxic infection. caused by milk borne pathogens like E. coli, Salmonella typhi, Staph aureus, Bacillus cereus etc.

Practicals

Morphological examination of common dairy organism (size and shape, arrangement and sporulation). Enumeration of psychrotrophic, thermophilic, thermoduric and spore forming bacteria in milk. Detection of sources of contamination: air, water, utensils, equipment and

personnel line testing. Spoilage of milk caused by microorganisms souring, sweet curdling, gassiness, lipolysis, ropiness, proteolysis and discoloration. Detection of mastitis milks, pH, SLST, somatic cell count, chloride content, Hotis test, CAMP test. Detection and estimation of coliforms; presumptive test, rapid coliform count, IMVIC test. Detection of important pathogens using selective media; E.coli, Staphylococcus aureus Salmonella and Bacillus cereus. Estimation of microbial load in milk by SPC and Dye reduction tests-(MBRT, RRT). Detection of antibiotic residues using qualitative test

Environmental Studies

Theory

Environmental Science: An introduction, Ecosystem: kinds, structure, characteristics, functioning, Biochemical cycles, Natural resources and their managements, Environmental pollution, Air pollution, Water pollution, Solid waste pollution, Noise pollution, Soil pollution, Radio active pollution, Food processing industry waste and its management, Management of urban waste water, Recycling of organic waste, Recycling of factory effluent, Control of environmental pollution through law, Composting of biological waste and Sewage, uses of water disposal effluent treatment, microbial examination.

Practicals

Environment and its analysis, Water quality parameters, collection of sample for pollution study, Determination of pH/acidity/alkalinity from sample, Estimation of dissolved oxygen, Estimation of BOD, Estimation of COD, Estimation of nitrates, Estimation of phosphates, Estimation of pollutant elements, Estimation of heavy/toxic elements, Estimation of lead/mercury, Visit to industrial sewage disposal unit.

Market Milk

Theory

Market milk industry in India and abroad: Distinctive features of tropical dairying as compared to those of the tropical climate of developed countries. Collection and transportation of milk; a) Organization of milk collection routes b) Practices for collection of milk, preservation at farm, refrigeration, natural microbial inhibitors, lactoperoxidase system. c) Microbial quality of milk produced on farm. Effect of pooling and storing on microbial quality of refrigerated milk. Role of psychrotrophs, Role of tropical climate on spoilage of milk d) Chemical tests for grading raw milk. e) Microbiological tests for grading raw milk. Reception and treatment (pre-processing steps) of milk in the dairy plant: a) Reception, chilling, clarification and storage: General practices. b) Homogenisation: Definition, pretreatments, theories, synchronization of homogenizer with operation of pasteurizer (HTST) c) Effect of homogenization on physical properties of milk. d) Bactofugation: Theory and microbiology. Thermal processing of milk: a) Principles of thermal processing: kinetics of microbial destruction, thermal death curve, Arrhenius equation, D value, Z value, F₀ value, Q₁₀ value. b) Factors affecting thermal destruction of microorganisms. c) Definition and description of processes: Pasteurization, thermisation, sterilization, UHT Processing. d) Microbiology of pasteurised milk, thermised, sterilized & UHT milk. e) Product control in market milk plant. f) Defects in market milk. g) Manufacture of special milks: toned,

doubled toned, reconstituted, recombined, flavoured, homogenized vitaminised and sweet acidophilus milk. h) Manufacture of sterilized milk. i) Distribution systems for market milk. Quality and safety aspects in dairy/food chain, good manufacturing practices (GMP) in dairy processing. UHT processing of milk : a) Relevance of UHT processing in the tropical climate b) UHT plants: Description. Direct, Indirect, with upstream and downstream homogenization, third generation UHT plants. c) Aseptic packaging, types and systems of packaging, sterilizing packages, filling systems. d) Technical control in the UHT plant. Training of personnel. Plant hygiene. e) Shelf life of UHT milk and tests for UHT milk. Nutritive value of milk. Effect of heat processing on nutritive value. Efficiency of plant operation: product accounting, setting up norms for operational and processing losses for quantity, fat and SNF, monitoring efficiency. Maintaining plant hygiene & HACCP. Cream: Types of cream separation, principles of centrifugal separation, efficiency of cream separation; Types of creams and legal standards

Practicals

Familiarization with equipments for reception of milk in plant; Pre-treatments: Chilling, clarification, filtration. Standardization and numericals relating to it. Cream separation: parts of separator and the process. Operation of LTLT, HTST pasteurizer, laboratory steriliser. Sampling and chemical examination of pasteurized, sterilized and UHT processed milk. Sampling and routine microbiological examination of pasteurized and sterilized milk. Preparation of special milks; toned, double toned, standardised, flavoured, sterilized milks. Cleaning of storage tanks, cream separators, HTST plants; manual cleaning and CIP. Detection of adulterants and preservatives in milk. Assessment of homogenisation efficiency in milk. Strength of common detergents and sanitizers used in market milk plant. Production of cream, standardization, homogenization, pasteurization of cream. Production of table, coffee cream

SEMESTER-II

Microbiology of Milk and Other Foods

Theory

A. Microbiology of Milk - Sources of microbial contamination of milk and their importance, Milk –borne diseases, Important groups of spoilage of microorganisms and their manifestation in milk, Microbial growth in milk during storage and transport, Taints and abnormal conditions in milk, Principles of sanitation practices at all stages of production and processing, Bacteriology of heat – treated milks, Evaluation of bacteriological features of milks.

B. Microbiology of Foods - Classification of foods, Natural functional systems of food and their interactions on shelf life, Food processing compulsions and options, Types of food spoilage and their aetiology, Methods of limiting microbial proliferation in foods , Features of food fermentations as a desirable change, Evaluation of microbiological features of foods

Practicals

A. Microbiology of Milk - Sampling of milk for microbiological analysis, Application of rapid tests for evaluation of milk quality, Enumeration of bacterial numbers by direct and indirect methods, Methods used for determining psychrotropic organisms in milk, Assessment of pasteurized milk based on the following: standard plate count, E coli test, Phosphatase test, Thermoduric and thermophilic numbers, Evaluation of utensils and equipment for sanitation

B. Microbiology of Foods - Comparative study of raw and processed foods, Study of food enzymes in relation to their profiles at shelf life, Effect of storage temperature on shelf life of foods, Microbiology of vegetables, eggs, meat, flour, bread, cereals and spices, Role of salt, sugar, inorganic acids and alkalis in food preservation

Chemistry of Milk

Theory

Definition and structure of milk, factors affecting composition of milk, Nomenclature and classification of milk proteins, Casein: Isolation, fractionation and chemical composition, physico-chemical properties of casein, Whey proteins: Preparation of total whey proteins: α -Lactalbumin and β -Lactoglobulin. Properties of α - Lactalbumin and β - lactoglobulin, Immunoglobulin and other minor milk proteins and non proteins nitrogen constituents of milk, Hydrolysis and denaturation of milk proteins under different physical and chemical environments, Estimation of milk proteins using different physical and chemical methods, Importance of genetic polymorphism of milk proteins ,Milk enzymes with special reference to lipases, Xanthine Oxidase, phosphates, proteases and lactoperoxidase, Milk carbohydrates their status and importance. Physical and chemical properties of lactose, Sugar amine condensation, Amadori rearrangement, production of hydroxyl methyl furfural (HMF), processing related degradation of lactose, Definition, general composition and classification of milk lipids. Nomenclature and general structure of glycerides, factors affecting the fatty acid composition. Milk phospholipids and their role in milk products, Unsaponifiable matter and fat soluble vitamins, Milk Salts: Mineral in milk (a) major mineral (b) Trace elements, physical equilibria among the milk salts and Milk contact surfaces and metallic contamination.

Practicals

Sampling techniques of chemical examination of milk. Determination of pH and titratable acidity of milk. Determination of fat in milk by different methods. Determination of total solids and solids not fat in milk. Determination of total milk proteins by Kjeldahal method. Determination of casein, whey proteins and NPN in milk. Estimation of alkaline phosphatase and lipase in milk. Determination of lactose in milk. Determination of ash in milk. Determination of phosphorus and calcium in milk. Determination of chloride in milk. Determination of temporary and permanent hardness of water. Estimation of available chlorine from bleaching powder.

Electrical Engineering

Theory

Alternating current fundamentals: Electromagnetic induction magnitude of induced E.M.F. Alternating current, R.M.S. value and average value of an alternating current. Phase relations and vector representation. A.C. series and parallel circuits, Concept of resonance, polyphase alternating current circuits, three-phase concept, Star and delta connections, star delta transformation, Energy measurement. Transformers: Fundamental of transformer, Theory, vector diagram without load and with load, Losses, voltage regulation and efficiency of transformer, auto-transformer. Alternators: Elementary Principles, Construction and different types of alternators, E.M.F. in alternators, circuit breakers. Induction motors: Fundamental principles, production of rotating fields, construction, Rotor winding-squirrel cage and phase wound rotors, Analysis of current and torque, starting of induction motors, Motor housing, selection of motor and its controls. D.C. Machines: Construction and operation of D.C. generator, Types of generators, various characteristics of generator, D.C. motors, torque- speed characteristics of D.C. motors, Starting and speed control of D.C. motors. Electric Power Economics: Maximum demand charge, Load factor and power factor correction. Measuring Instruments: Classification of instruments, Elements of a generalized measurement system static and dynamic characteristics.

Practicals

Study of voltage resonance in L.C.R. circuits at constant frequency; (a) Star connection-study of voltage and current relation (b) Delta connection-study of voltage and current relation. Measurement of power in 3-phase circuit; (a) For balanced loads (b) For unbalanced loads, by wattmeter and energy meters. Polarity test, no-load test, efficiency and regulation test of single phase. Voltage and current relation in a 3-phase transformer of various kinds of primary and secondary connection systems. Starting of induction motor by the following starters : (i) D.O.L. (ii) Manual star- delta (iii) Automatic star-delta (iv) Manual auto-transformer. Starting of slip-ring induction motor by normal and automatic rotor starters. Test on 3-phase induction motor, determination of efficiency, line current, speed, slip, power factor at various outputs. Determination relation between the induced armature voltage and speed of separately excited D.C. generator. Magnetization characteristic of D.C. generator. Study the starter connection and starting reversing and adjusting speed of a D.C. motor. Study of various measuring instruments.

Market Milk Process Equipments

Theory

Sanitary metal and features of sanitary designs, Stainless steel Pipes and Fitting, Receiving room equipments, Working and maintenance of mechanical can washers, Different types of milk chilling equipments and their application, constructional features of milk storage tanks, Principles of centrifugal separation, cream separators, self desludging clarifiers, bactofugation, Efficiency, capacity and maintenance of separators, Constructional features, operation and maintenance of batch and HTST, pasteurizers, accessories and controls, Equipment for milk sterilization and UHT processing, Homogenizers: constructional features, operation of maintenance of homogenizers and accessories, Milk sachet and aseptic filling machines and their maintenance, C.I.P cleaning systems

Practicals

Study the constructional features and operation of the following equipments - Mechanical can washer, Plate chiller, Milk storage tank, Cream separator, Homogenizers, Batch, pasteurizer, H.T.S.T Pasteurizer, FDV controller, Sachet filling machine.

Fat rich and Indigenous Dairy Products

Theory

Butter: history, legal standards, neutralization of cream, types of neutralizers and their effect on butter quality, ripening, churning, fat losses in buttermilk; types of churns; overrun, moisture control, defects in butter, packaging; manufacture of table butter

Ghee: production by different methods, quality of ghee, effect of clarification on quality of ghee, granulation and flavour production in ghee. Packaging of ghee, defects, shelf life of ghee; judging and grading of ghee.

Indigenous milk products: Status of indigenous dairy products. Heat desiccated milk products: khoa, basundi etc.; Acid coagulated products: chhana, chakka, shrikhand, dahi etc.; Indigenous milk based sweets: gulabjamun, rasogolla, sandesh and other popular delicacies. Fermented products: dahi, lassi. Frozen products: kulfi. Defects of indigenous dairy products, remedies and prevention.

Modern developments and improvements in the manufacture of indigenous dairy products

Practicals

Neutralisation and ripening of cream; manufacture of butter, preparation of ghee by different methods, judging of butter and ghee, Preparation of khoa, chhana, chakka, paneer. Preparation of milk sweets: burfi, gulabjamun, rasogolla, sandesh, shrikhand and other sweets.

Cheese, Fermented Products and By-products

Theory

Fermented products: history and development, Production of yoghurt, acidophilus milk, Packaging of fermented products and by-products, Nutritive values and legal standards, History of cheese making, Legal standards, Classification and composition of common varieties of cheese, Technology of manufacture of cheddar, Gouda, Mozzarella, Cottage cheese, Processed cheese and cheese spread; Stabilizers and emulsifiers used in processed cheese; physical, chemical and bacteriological changes during ripening process; packaging and defects, Judging and grading of cheese.

By-products- Classification and characterization; use of whey, preparation of whey protein; manufacture of lactose, casein, caseinates and their use.

Practicals

Production of yoghurt and acidophilus milk, Production of Cheddar cheese, Gouda cheese, cottage cheese, Mozzarella cheese, processed cheese, cheese spread; packaging of cheese; judging and grading of cheese; preparation of lactic acid and rennet caseinates, calcium caseinate, whey protein concentrate, whey powder, lactose, whey drink.

Condensed and Dried Milks

Theory

Status of condensed and dried milk industry in India and abroad, Composition and legal standards of condensed milk and dried milk products, Technology of manufacture of sweetened condensed milk and evaporated milk, Defects, causes and remedies, Packaging and keeping quality of condensed and evaporated milk, Principle of drum drying, spray drying, foam drying, Manufacture of skim, whole, malted milk powders, Defects in dried milks and their causes, prevention, Packaging and storage, Instantised milk powder, infant food formulation and method of manufacture

Practicals

Vacuum pan operation, Operation of roller and spray driers, Production of sweetened condensed and evaporated milks, Production of roller dried milk powders, Production of spray dried skin milk powders, Judging and grading of condensed and dried milk products

SEMESTER-III

Ice-cream and Frozen Dairy Products

Theory

Status of ice-cream industry, Classification of frozen dairy products, Composition of ice-cream, BIS and FSSAI standards for ice-cream. Calculation of mixes, ice-cream ingredients, stabilizers and emulsifiers, flavouring and colouring materials, Mix processing, ice cream freezers, packaging and handling of ice-cream, Judging and grading of ice-cream, Fruit ice-cream, nut ice-cream, kulfi preparation, Frozen Yoghurt, characteristics and production, Defects in frozen products, prevention and remedies

Practicals

Selection of ingredients for ice-cream, calculation for mix preparation, Preparation of ice-cream and kulfi, Preparation of fruit ice-cream, Production of frozen yoghurt, Judging and grading of frozen dairy products, Packaging materials and packaging of frozen dairy products

Dairy Products Equipments

Theory

Equipments for indigenous dairy products, Equipments for fermented and coagulated dairy products, Ice cream freezers, batch types, Ice cream freezer continuous type, accessories, Butter churn, Equipments for condensed milk, vacuum pan, Classification of continuous evaporators, Multiple effect evaporator and accessories equipment for drying milk, roller drier, parallel and counter flow spray dries and their accessories, Plant layout and design, site selection, Factors concerning design and layout, Features of dairy floors and ventilation, Dairy waste treatment and methods of disposal

Practicals

Study the constructional features and operation of the following equipments - Equipment for manufacture of indigenous dairy products, Cheese equipment, Butter churn, Vacuum pan, Multiple effect evaporator, Roller drier, Spray drier To draw layouts for: Chilling centers, Market milk plant, Composite milk plant

Chemical Quality Assurance

Theory

Responsibility and organization of quality control department, general principles, Principles of Quality Control, Quality Assurance, Total Quality Management, HACCP, ISO 9001 and ISO 22000, Food laws and standards – FSSAI, BIS, AG Mark, IDF, Calibration- Calibration of dairy glassware lactometer, butyrometer, milk pipette and thermometer, Colour and glass- Natural and synthetic colours, specification of colour for dairy foods, Flavour: flavour, components in dairy foods, artificial flavours, Additives: stabilizers, emulsifiers, sweeteners, vitamins, minerals, amino acids/ protein hydrolysate, antioxidants, preservatives, neutralizers, colouring matter and

flavouring agents, Packaging: packaging material for dairy foods types and properties, Contaminants: pesticides residues, heavy metals, toxins, antibiotics, detergents, sanitizers and contaminants for packaging materials, Sensory evaluation: general introduction, testing conditions, taste odour aroma, texture, appearance and other parameters, difference tests and ranking tests. Individual steps in selection of test subjects, Water: Analysis , treatment , Detergents and sanitation :types, properties and analysis , Elementary knowledge of instrumental analysis

Practicals

Calibration of milk testing equipments, buytrometer, lactometer, milk pipettes, thermometers etc , Sensory evaluation of dairy foods for colour, appearance, taste, odor, texture and acceptability-different tests and ranking tests, Estimation of temporary and permanent hardness of water, Estimation of alkalinities in detergent solutions, Estimation of available chlorine and iodine in sanitizers, Separation of dairy food colours by thin layer, chromatography (demonstration)

Microbiological Quality Assurance

Theory

Basic concepts of food biology: Their relation to quality assurance, Food class orientation to plant & animal origin. Problems associated with natural foods for human consumption, Role of microbial systems in conservation of raw foods for better utility. Food safety: traditional problem emerging problems. Regulatory systems/ agencies: Government/NGO/Professional/other agencies. Mandatory regulations like FSSA etc, Optional advisory systems like BIS, AG Mark, IDF etc. Comparative standards for milk produce and milk based foods of countries pioneering in specified foods, Role of supporting services systems in quality food processing: Water, air, personnel, their health, hygiene and habits, Equipment design, material used, construction, finish, Maintenance and Hygiene, packing material, nature design and hygiene, Warehousing and condition of their maintenance, Shipping or transport systems & their handling. Food plant hygiene: Basic cleaning systems, detergent support and sanitizers. Their evaluation, food service labelling, Need for providing consumer guidance on the time limit for safe consumption, Consumer assessable methods for safety of canned foods, Sampling procedures for microbiological evaluation foods, Total quality management (TQM) systems for food industry: Quality audit concepts (ISO-9000 etc.) a holistic growth from elementary quality control to quality assurance culminating in total quality system, Hazard analysis of critical control points (HACCP):HACCP an essential tool for supporting operation of TQM in food processing industries, Microbiological quality of milk and milk production: Historical to current state of art.

Practicals

Sampling procedure for microbiological evaluation of foods, Evaluation of foods for public health safety, Salmonella, Shigella, Staphylococci, Clostridia, Listeria, Bacillus Cereus, Campyloboacter, Monitoring microbial density of air-environment of processing plants, Evaluation of microbiological quality of water for the processing plant, Assessment of hygiene of personnel working in the plant, Evaluation of equipment decision, material used construction, finish and maintenance for hygiene, Assessment of packaging material for hygiene, Assessment of warehouse and their maintenance of microbiological contamination, Evaluation on basic cleaning systems, detergents support and sanitizers, HACCP evaluation of manufacturing process,

Assessment of microbiological quality of milk and milk products.

Extension Communication and Dairy Entrepreneurship Management

Theory

Concept, philosophy, principles, genesis, growth and scope of extension education. Teaching learning process and its principles. Public and Private Extension Institutions, Dairy Extension programmes.

Communication- Meaning, Concept and Models of Communication, Key elements of communication. Communication process and Methods, Feedback in Communication and Problems in Communication. Modern Information Communication Technologies (ICT) tools in Dairy Extension. Multi-media projection and computer aided teaching aids for dairy extension.

Definition and Concept of Enterprise and Entrepreneurship. Characteristics, Approaches and Importance of Dairy entrepreneurship. Traits of entrepreneurs and types of entrepreneurs. Entrepreneurial and managerial characteristics. Institutions and Organizations for Entrepreneurship development. Entrepreneurship development programs; SWOT analysis. Government schemes and incentives for promotion of entrepreneurship.

Management – Concept, Principles, Functions of Management and Importance in Dairy context. Production management, concept, functions and structure of production management. Industrial relations, Personnel management and manpower planning. Job Specifications, job evaluation, job enhancement, job enrichment. Dairy Institutions and Organizations for Dairy management, Good Management Practices for Dairy Industry.

Practicals

Orientation to various communication tools & techniques and communication skills. Study of the organizational set-up and functioning of State Animal Husbandry Department and dairy/rural development agencies. Field visit to dairy enterprises - Study of characteristics of successful dairy enterprises and entrepreneurs. Profile study of Indian Dairy processing and export industries. Case study of Successful Dairy Entrepreneurs. Swot analysis of various Entrepreneurship development programmes. Understanding the functioning of dairy/ development institutions – Dairy Cooperatives and critical evaluation of different dairy development programmes. Understanding the functioning of dairy industries, field visits to various mini & mega dairy.

Chemistry of Milk Products

Theory

Physicochemical changes in milk and milk constituents during heating, concentration and drying, effect on nutritional values

Cream: Creaming, Stokes Law, factors affecting creaming, standards

Butter: Structure of butter, mechanism of churning, defects in butter, flavour of butter, standards, packaging

Ghee: Composition characteristic fat constants, organoleptic properties. Genesis of flavour and texture. Hydrolytic and autoxidative spoilage of ghee and its prevention. Natural and synthetic antioxidants. Common adulterants and their detection, standards, packaging. Ghee residue.

Concentrated milk: Evaporated and sweetened condensed milk. Physico chemical aspects involved in the manufacture of evaporated milk as affected by process variables. Storage defects and their prevention, standards, packaging

Dried milk: Roller drying and spray drying instantisation. Physico-chemical aspects during

processing. Storage defects. Standards, packaging

Coagulated products: Milk clotting enzymes from different sources –animals, microbial and plant. Rennet action, changes taking place during manufacture and ripening of cheese, types of cheese, packaging and standards

Fermented products: Varieties, changes in milk constituents during fermentation, flavour development nutritional and therapeutic value of fermented milk products, packaging, standards

Indigenous milk products: Khoa, Chhana, Paneer, Chakka, Srikhand, Peda, Burfi, Rasagolla, Basundi etc. composition, quality attributes and defects, packaging standards

Frozen Products: Composition of ice-cream and kulfi, role of different constituents and processing parameters (homogenization, whipping, over-run) in physical attributes of ice-cream and kulfi. Defects in ice-cream and kulfi, packaging, standards

Practicals

Cream: sampling and analysis of cream for fat and acidity Butter: determination of moisture, fat, salt, curd and acidity

Ghee : determination of fat constants, melting point, refractive index, RM and Polenske values, saponification value, iodine value , determination of acidity and peroxide value

Concentrated milk: Sampling, determination of total solids, fat proteins, sucrose and lactose Milk powder: sampling determination of moisture, total solids , fat, proteins, total solids, fat, protein, total ash, carbohydrates, lactate, solubility percent, insolubility index bulk density

Cheese: sampling. Determination of moisture, fat, protein, salt and acidity

Dahi : sampling, determination of total solids, fat and acidity

Indigenous products: sampling and analysis of khoa, channa, chakka, and paneer for moisture/total solids, fat and proteins

Ice-cream: sampling, determination of over-run, weight per litre acidity, fat, total solids, protein and sucrose

Financial Accounting

Theory

Introduction: definition, objectives, common terms and different systems of accounting. Double entry system of book-keeping. Preparation of financial statements. Banking transaction-recording and bank reconciliation statements. Recording of transactions in cash book, purchase book, purchase returns book and sales return book. Capital and revenue expenditure- classification. Depreciation. Final accounts with adjustments. Errors & corrections. Analysis of financial statements. Uses of financial information in decision- making.

Practicals

Ledger & trial balance, Cash book, Adjustments, Capital and revenue expenditure, Depreciation, Errors and corrections