

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE: Dairy Farmer/Dairy Entrepreneur

(QUALIFICATION PACK: Ref. Id. AGR/Q4101)

SECTOR: Agriculture

Classes 11 and 12

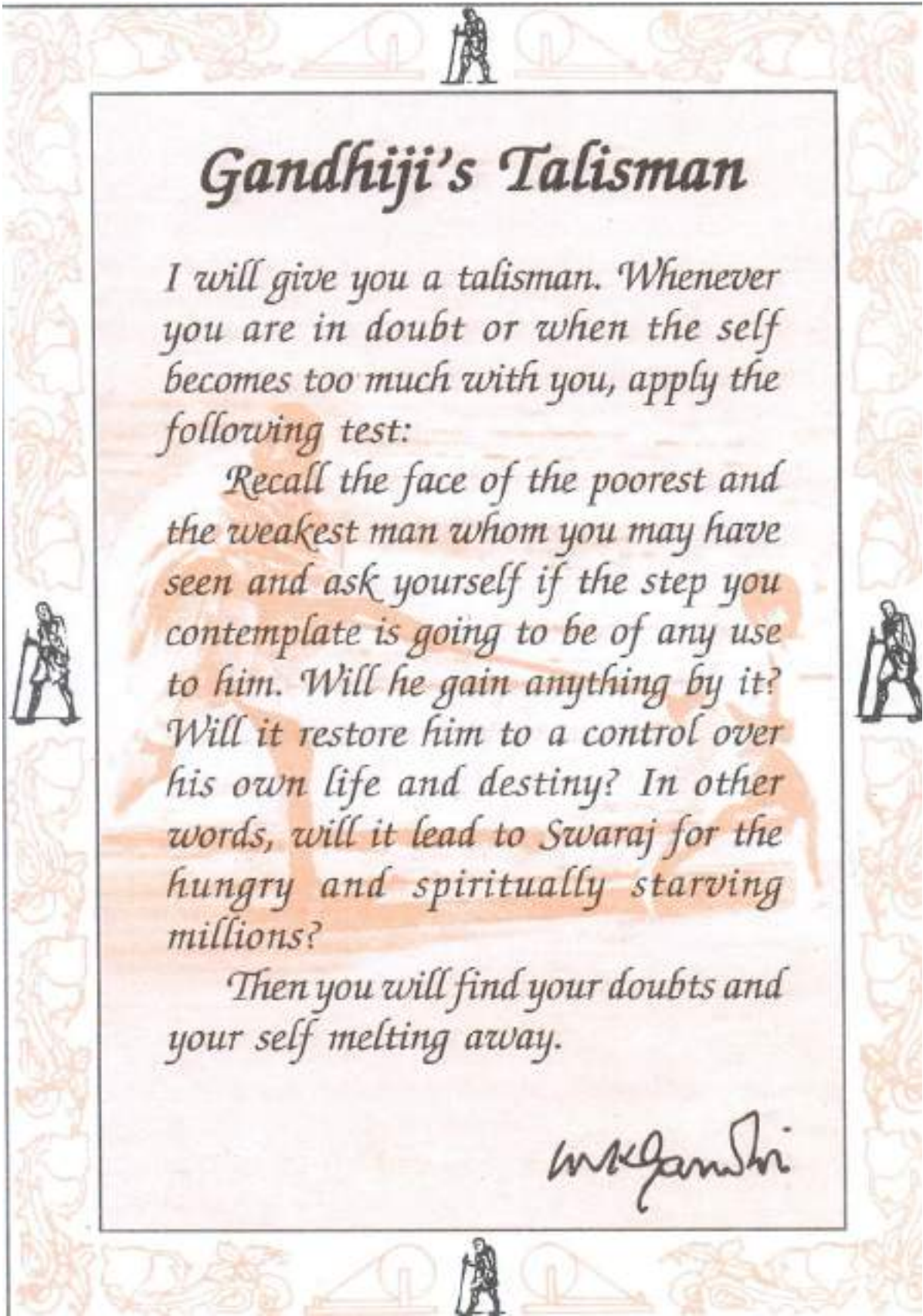


PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under MHRD, Government of India)

Shyamla Hills, Bhopal- 462 013, M.P., India

<http://www.psscive.ac.in>



Gandhiji's Talisman

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Then you will find your doubts and your self melting away.

M.K. Gandhi

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CURRICULUM**

Dairy Farm management - Dairy
farmer/dairy entrepreneur

June, 2017

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FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) a constituent of the National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based curricula and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education (CSSVSHSE) launched by the Ministry of Human Resource Development, Government of India in 2012. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA). The main purpose of the competency based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based curriculum as part of the vocational training packages for the job role of Greenhouse Operator. The curriculum has been developed for the secondary students of vocational education and is aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF).

The curriculum aims to provide children with employability and vocational skills to support occupational mobility and lifelong learning. It will help them to acquire specific occupational skills that meet employers' immediate needs. The teaching process is to be performed through the interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences.

The curriculum has been developed and reviewed by a group of experts and their contributions are greatly acknowledged. The utility of the curriculum will be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further improvement in this document.

HRUSHIKESH SENAPATY
Director
National Council of Education Research and Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth are immense and the possibilities are equally exciting. The world is looking at us to deliver sustainable growth and progress. To meet the growing expectations, India will largely depend upon its young workforce. The much-discussed demographic dividend will bring sustaining benefits only if this young workforce is skilled and its potential is channelized in the right direction.

In order to fulfil the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSSCIVE Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop learning outcome based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation need to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfil the needs of the society and the world of work. In order to honour its commitment to the nation, the PSSCIVE has initiated the work on developing learning outcome based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and courseware for over 100 job roles in various sectors.

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum. We are grateful to MHRD and NCERT for the financial support and cooperation in realising the objective of providing learning outcome based modular curricula and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Rashtriya Madhyamik Shiksha Abhiyan (RMSA)* of MHRD.

Finally, for transforming the proposed curriculum design into a vibrant reality of implementation, all the institutions involved in the delivery system shall have to come together with a firm commitment and they should secure optimal community support. The success of this curriculum depends upon its effective implementation and it is expected that the managers of vocational education and training system, including subject teachers will make efforts to create better facilities, develop linkages with the world of work and foster a conducive environment as per the content of the curriculum document.

The PSSCIVE, Bhopal remains committed in bringing about reforms in the vocational education and training system through the learner-centric curricula and courseware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st Century.

RAJESH P. KHAMBAYAT
Joint Director
PSS Central Institute of Vocational Education

ACKNOWLEDGEMENTS

On behalf of the team at the PSS Central Institute of Vocational Education (PSSCIVE) we are grateful to the members of the Project Approval Board (PAB) of *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA) and the officials of the Ministry of Human Resource Development (MHRD), Government of India for the financial support to the project for development of learning outcome based curricula.

We are grateful to the Director, NCERT for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of RMSA, MHRD, RMSA Cell at the National Council of Educational Research and Training (NCERT), National Skill Development Agency (NSDA), National Skill Development Corporation (NSDC) and Agriculture Skill Council of India (ASCI) for their academic support and cooperation.

We are grateful to the course coordinator Vinay Swarup Mehrotra for his untiring efforts and contributions in the development of this learning outcome based curriculum. The contributions of Prof. R. P. S. Baghel, Dean of Instructions, Nanaji Deshmukh Vet. Sci. Univ, Jabalpur and Dr. D. L. N. Rao, Emeritus Scientist, Indian Institute of Soil Science, Nabi Bagh, Berasia Road, Bhopal is thankfully acknowledged.

The contributions made by Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC), Vipin Kumar Jain, Associate Professor and Head, Programme Planning and Monitoring Cell (PPMC) and Dipak Shudhalwar, Associate Professor, Department of Engineering and Technology, PSSCIVE in the development of the curriculum for employability skills are duly acknowledged.

The assistance provided by Mr. Durgesh Kumar Satankar, Computer Operator Grade II in typing and composing of the material is duly acknowledged.

PSSCIVE Team

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1. COURSE OVERVIEW

Dairy Farmer/ Entrepreneur

A Dairy Farmer / Entrepreneur is a person who is responsible for various activities involved in dairy farm management. The Dairy Farmer takes various decisions for the viability and sustainability of the dairy farm. He / She ensure proper care of dairy animals, their health and productivity, milking and marketing of the produced milk. The job is to be performed in an efficient manner to allow the production of high quality milk and promote animal well-being and comfort. The Dairy Farmer/Entrepreneur should work independently, and have the ability to make various strategic and operational decisions pertaining to his / her area of work. The individual should have clarity and should be result oriented. The individual should also be able to demonstrate skills to use various tools.

COURSE OUTCOMES: On completion of the course, students should be able to:

- Efficiently start and manage a dairy farm: dairy Industry, input requirements, site selection, cattle selection, budget estimation, procurement of inputs, etc.
- Construct and maintain shed for cattle: Resources availability, shed construction – types, maintenance of shed; prepare and give recommended feed and water for livestock: feed Nutrients composition, feed requirements.
- Maintain health of livestock along with productivity: vaccination of cattle, nutrient requirements.
- Understand and prepare forage: forage types, types of storage.
- Effectively market dairy products like milk, curd, cheese: milk products, manufacturing, standards, market value, and marketing of the product.
- Ensure safe and clean dairy farm: hygiene maintenance.

COURSE REQUIREMENTS: The learner should have the basic knowledge of science.

COURSE LEVEL: On completion of this course, a student can take up a higher level course for a job role in dairy management, such as dairy supervisor.

COURSE DURATION: **600 hrs**

Class 11 : 300 hrs

Class 12 : 300 hrs

Total : 600 hrs

2. SCHEME OF UNITS

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Class 11 and 12, opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Class 11 is as follows:

CLASS 11			
	Units	No. of Hours for Theory and Practical =300	Max. Marks for Theory and Practical = 100
Part A	Employability Skills		
1.	Communication Skills	25	02
2.	Self-management Skills	25	02
3.	Information and Communication Technology Skills	20	02
4.	Entrepreneurial Skills	25	02
5.	Green Skills	15	02
	Total	110	10
Part B	Vocational Skills		
6.	Introduction to Dairy Farming	25	
7.	Prepare and Maintain Livestock Accommodation	25	05
8.	Establish Livestock within Accommodation	45	05
9.	Provide Feed and Water for Livestock	45	05
10.	Forage Conservation	20	05
	Total	160	20
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	5	20
	Grant Total	300	100

The unit-wise distribution of hours and marks for Class 12 is as follows:

CLASS 12			
Units		No. of Hours for Theory and Practical =300	Max. Marks for Theory and Practical = 100
Part A	Employability Skills		
1.	Communication Skills	25	02
2.	Self-management Skills	25	02
3.	Information and Communication Technology Skills	20	02
4.	Entrepreneurial Skills	25	02
5.	Green Skills	15	02
	Total	110	10
Part B	Vocational Skills		
6.	Maintain Healthy Performance of Livestock	35	05
7.	Performing Hand and Machine Milking	45	05
8.	Entrepreneurship	35	05
9.	Maintain Health & Safety at the workplace	45	05
	Total	160	20
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	5	20
	Grant Total	300	100

3. TEACHING/TRAINING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

Practical work may include but not limited to hands-on-training, simulated training, role play, case based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the vocational teacher to the Head of the Institution.

FIELD VISITS/ EDUCATIONAL TOUR

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Vocational Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least ten field visits should be conducted in a year.

4. ASSESSMENT AND CERTIFICATION

Upon successful completion of the course by the candidate, the Central/ State Examination Board for Secondary Education and the respective Sector Skill Council will certify the competencies.

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOSs), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know

the competencies acquired through the vocational subject or course. The assessment should be reliable, valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

KNOWLEDGE ASSESSMENT (THEORY)

Knowledge Assessment should include two components: one comprising of internal assessment and second an external examination, including theory examination to be conducted by the Board. The assessment tools shall contain components for testing the knowledge and application of knowledge. The knowledge test can be objective paper based test or short structured questions based on the content of the curriculum.

WRITTEN TEST

It allows candidates to demonstrate that they have the knowledge and understanding of a given topic. Theory question paper for the vocational subject should be prepared by the subject experts comprising group of experts of academicians, experts from existing vocational subject experts/teachers, subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

The blue print for the question paper may be as follows:

Duration: 3 hrs

Maximum Mark: 30

	Typology of Question	No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	3	2	2	13
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	2	3	2	14
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	2	1	07
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	2	0	04
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	Total	5x1=5	10x2=20	5x3=15	40 (20 questions)

CLASS 11

Part A: Employability Skills

S.No.	Units	Duration (Hrs)
1.	Communication Skills	25
2.	Self-management Skills	25
3.	Information and Communication Technology Skills	20
4.	Entrepreneurial Skills	25
5.	Green Skills	15
Total		110

Unit 1: Communication Skill – III			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication - Verbal - Non-verbal - Visual	1. Writing pros and cons of written, verbal and non-verbal communication 2. Listing do's and don'ts for avoiding common body language mistakes	05
2. Identify specific communication styles	1. Communication styles- assertive, aggressive, passive-aggressive, submissive, etc.	1. Observing and sharing communication styles of friends, teachers and family members and adapting the best practices 2. Role plays on communication styles.	10
3. Demonstrate basic writing skills	1. Writing skills to the following: • Sentence • Phrase • Kinds of Sentences • Parts of Sentence • Parts of Speech • Articles • Construction of a Paragraph	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject	10
Total			25

Unit 2: Self-management Skills – III			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
1. Demonstrate impressive appearance and	1. Describe the importance of dressing appropriately, looking	1. Demonstration of impressive appearance and	

grooming	<p>decent and positive body language</p> <ol style="list-style-type: none"> Describe the term grooming Prepare a personal grooming checklist Describe the techniques of self-exploration 	<p>groomed personality</p> <ol style="list-style-type: none"> Demonstration of the ability to self- explore 	10
2. Demonstrate team work skills	<ol style="list-style-type: none"> Describe the important factors that influence in team building Describe factors influencing team work 	<ol style="list-style-type: none"> Group discussion on qualities of a good team Group discussion on strategies that are adopted for team building and team work 	10
3. Apply time management strategies and techniques	<ol style="list-style-type: none"> Meaning and importance of time management – setting and prioritizing goals, creating a schedule, making lists of tasks, balancing work and leisure, using different optimization tools to break large tasks into smaller tasks. 	<ol style="list-style-type: none"> Game on time management Checklist preparation To-do-list preparation 	05
Total			25

Unit 3: Information and Communication Technology Skills - III			
Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 Hrs)
1. Create a document on word processor	<ol style="list-style-type: none"> Introduction to word processing. Software packages for word processing. Opening and exiting the word processor. Creating a document 	<p>1. Demonstration and practice of the following:</p> <ul style="list-style-type: none"> Listing the features of word processing Listing the software packages for word processing Opening and exit the word processor Creating a document 	10
2. Edit, save and print a document in word processor	<ol style="list-style-type: none"> Editing text Wrapping and aligning the text Font size, type and face. Header and Footer Auto correct Numbering and bullet 	<p>1. Demonstration and practising the following:</p> <ul style="list-style-type: none"> Editing the text Word wrapping and alignment Changing font type, size and face Inserting header and footer Removing header and 	10

	7. Creating table 8. Find and replace 9. Page numbering. 10. Printing document. 11. Saving a document in various formats.	footer 1. Using autocorrect option 2. Insert page numbers and bullet 3. Save and print a document	
Total			20

Unit 4: Entrepreneurial Skills - III			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
1. Describe the significance of entrepreneurial values and attitude	1. Values in general and entrepreneurial values 2. Entrepreneurial value orientation with respect to innovativeness, independence, outstanding performance and respect for work	1. Listing of entrepreneurial values by the students. 2. Group work on identification of entrepreneurial values and their roles after listing or reading 2-3 stories of successful entrepreneur 3. Exhibiting entrepreneurial values in Ice breaking, rapport building, group work and home assignments	10
2. Demonstrate the knowledge of attitudinal changes required to become an entrepreneur	1. Attitudes in general and entrepreneurial attitudes 2. Using imagination/ intuition 3. Tendency to take moderate risk 4. Enjoying freedom of expression and action 5. Looking for economic opportunities 6. Believing that we can change the environment 7. Analyzing situation and planning action 8. Involving in activity	1. Preparing a list of factors that influence attitude in general and entrepreneurial attitude 2. Demonstrating and identifying own entrepreneurial attitudes during the following micro lab activities like thematic appreciation test 3. Preparing a short write-up on "who am I" 4. Take up a product and suggest how its features can be improved 5. Group activity for suggesting brand names, names of enterprises, etc.	15

Total			25
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Unit 5: Green Skills - III			
Learning Outcome	Theory (07 hrs)	Practical (08 hrs)	Duration (15 Hrs)
1. Describe importance of main sector of green economy	1. Main sectors of green economy- E-waste management, green transportation, renewal energy, green construction, water management 2. Policy initiatives for greening economy in India	1. Preparing a poster on any one of the sectors of green economy 2. Writing a two-page essay on important initiatives taken in India for promoting green economy	08
2. Describe the major green Sectors/Areas and the role of various stakeholder in green economy	1. Stakeholders in green economy 2. Role of government and private agencies in greening cities, buildings, tourism, industry, transport, renewable energy, waste management, agriculture, water, forests and fisheries	1. Preparing posters on green Sectors/Areas: cities, buildings, tourism, industry, transport, renewable energy, waste management, agriculture, water, forests and fisheries	07
Total			15

Part B: Vocational Skills

S.No.	Units	Duration (Hrs)
1.	Introduction to Dairy Farming	25
2.	Prepare and Maintain Livestock Accommodation	25
3.	Establish Livestock within Accommodation	45
4.	Provide Feed and Water for Livestock	45
5.	Forage Conservation	25
	Total	165

Unit 1: Introduction to Dairy Farming			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Understand role of a dairy farmer	2. Importance of dairy farming 3. Per capita availability of milk in India and	1. Since the Unit is purely theoretical in nature, the students should be given paper –pencil tests of	5

Unit 1: Introduction to Dairy Farming			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
	<p>the world</p> <p>4. Species wise milk production in India</p> <p>5. Employment potential in dairy sector in India</p>	multiple choice, fill in the blanks and true/false etc.	
2. Understand the different indigenous and exotic breeds	<p>1. Concept of Indigenous and Exotic breeds</p> <p>2. Variations in milk yield of different breeds</p>	<p>1. Visit to Dairy Farm for identification of various breeds of cattle and buffalo</p> <p>2. Explain key distinguishing features of various breeds of cattle and buffalo</p>	5
3. High milk yielding breeds of cattle and buffaloes	<p>1. Study of the following breeds of cattle and buffalo:</p> <p>a. Jersey</p> <p>b. Holstein Friesian</p> <p>c. Gir and Sahiwal</p> <p>d. Tharparkar</p> <p>e. Mehsana</p> <p>f. Murrah</p> <p>g. Other breeds prevalent and popular in concerned states</p>	<p>1. Visit to Dairy Farm for identification of various breeds of cattle and buffalo</p> <p>2. Explain key distinguishing features of various breeds of livestock</p>	5
4. Selection of cattle and buffaloes	<p>1. Selection as a time-honoured technique for improvement of livestock.</p> <p>2. Recent increased attention to this technique for improvement of Indigenous breeds of cattle and buffaloes</p>	<p>1. Visit to Dairy Farm for identification of various breeds of cattle and buffalo improved through the technique of selection</p> <p>2. Explain key differences in the technique of selection and cross breeding in various breeds of livestock</p>	5
5. Differentiate between healthy and sick animals	<p>1. Concept of health in farm animals</p>	<p>1. Different signs of healthy animals</p>	5

Unit 1: Introduction to Dairy Farming			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
	2. Losses in farm production due to animal sickness	2. Different signs of sickness in animals	
Total			25

Unit 2: Prepare and Maintain Livestock Accommodation			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
1. Understand the accommodation needs of livestock	1. Importance and need of livestock housing 2. Purposes of animal housing	1. Visit to Dairy Farm to understand the need for livestock housing	3
2 Understand the different types of accommodation i) Loose housing ii) Conventional housing	1. Various types of animal accommodation such as loose housing, single row, head to head and tail to tail etc. 2. Suitability of different housing systems for different animal species and various life stages of animals	1. Calculate the floor space requirement for cattle and buffalo 2. Calculate resting area for given number of animals 3. Draw an outline of Tail to Tail and Head to Head system of housing 4. Prepare a layout plan for a large dairy farm of 100 animals	6
3 Understand the best balance between animal health and well-being and available resources	1. Principles of animal accommodation. 2. Balance between animal health and well-being and available resources	1. Visit to a nearby Dairy Farm to explain the optimization of available resources at the farm and housing needs of animals	4
4 Recognize and use tools/equipment necessary for preparation of accommodation	1. Equipment and machinery required for livestock housing 2. Equipment and machinery required for dairy section, feed	1. Wherever possible allowing the students to work with their own hands with the help of various	4

Unit 2: Prepare and Maintain Livestock Accommodation			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
	processing and fodder production	equipment on the farm 2. Prepare a routine of daily activities to be undertaken at the dairy farm 3. Prepare a routine of monthly activities to be undertaken at the dairy farm 4. Prepare a routine of quarterly activities to be undertaken at the dairy farm	
5 Understand the different methods of waste handling/ management	1. Area for disposal of manures 2. Method of disposal of solid manure 3. Manure pits 4. Disposal of liquid manures	1. Calculate the manure output in kg/day in cattle, buffalo, sheep and goat 2. Calculate how much time in a daily schedule of operations at a dairy farm is consumed in handling waste and general cleaning at the farm	4
6 Plan and follow the routine cleaning of animal sheds	1. Different types of sheds and barn/parlour at a dairy farm like milking animal shed, milking parlour, utility room, suckling calves room, calving box, dry animal shed, calf shed etc.	1. Incorporate in the schedule of daily farm operations the routine activities for cleaning of different types of sheds	4
Total			25

Unit 3: Establish Livestock within Accommodation			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
1. Understand the requirement of suitable personal protective equipment while establishing livestock in accommodation	<ol style="list-style-type: none"> 1. Need for personal protective equipment (PPE) for dairy worker. 2. Common PPE used at a dairy farm 	<ol style="list-style-type: none"> 1. Identification and use of different personal protective equipment 	9
2. Check the suitability of environmental conditions for establishing livestock within it	<ol style="list-style-type: none"> 1. Appropriate livestock accommodations required for each type of animal 2. Materials (e.g. bedding) and environmental conditions e.g. temperature, humidity, ventilation etc. which animals need within their accommodation to maintain their health and well-being 3. Specific needs of animals requiring more care and how these can be achieved 	<ol style="list-style-type: none"> 1. Visit dairy farm and check if equipment, materials and accommodation are suitable for reception of the livestock, prior to their arrival 2. Record suitable environmental conditions for the animals e.g. temperature, humidity etc. at the dairy farm 	11
3. Follow the proper handling to minimize stress	<ol style="list-style-type: none"> 1. Settlement of animals in a new place, and why this is important 2. Transportation of dairy animals by foot, road, rail, ship and air 3. Loading and unloading of livestock and animals not suitable for transport 4. Methods of handling livestock safely 5. Identifying stressed, normal and abnormal behavior within a given flock of livestock 	<ol style="list-style-type: none"> 1. Demonstrate methods of handling livestock safely 2. Specify maximum daily distance for transporting animal by foot, road, rail, ship and air 	7

4. Understand and follow the safety procedures while establishing accommodation for livestock	<ol style="list-style-type: none"> 1. Effects of different cleaning methods and materials on the health and well-being of animals and how to minimize any detrimental effect 2. Organizational and animal health and safety; dairy farmer's responsibility under relevant health, safety and animal welfare legislation 3. Consequences of failing to monitor or report effectively the variations in housing standards 	<ol style="list-style-type: none"> 1. Monitor the livestock carefully to ensure that their on-going health and welfare is maintained 	9
5. Ensure cleanliness and follow proper method of waste disposal	<ol style="list-style-type: none"> 1. Cleaning routines appropriate to the animal species concerned and the accommodation in which they are being kept 2. Hygiene standards, disinfectants, cleaning techniques, agents, and equipment/ materials. 	<ol style="list-style-type: none"> 1. Visit to dairy farm and observe how to clean animal housing areas, floors and mats. 2. Carry out cleaning routines of animals as per prescribed procedures. 3. Monitor regular disposal of animal waste and other wastes as per prescribed procedures 	9
Total			45

Unit 4: Provide Feed and Water for Livestock			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
1. Understand the feed composition and quality	<ol style="list-style-type: none"> 1. Types of animal feed stuffs 2. Characteristics of good animal 	<ol style="list-style-type: none"> 1. Explain the concept of partitioning of feedstuffs into CF, TDN and 	10

Unit 4: Provide Feed and Water for Livestock			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
	feed 3. Measuring the quality of animal feed	additives	
2. Understand the nutrients requirement for animals	1. Concept of total digestible nutrients (TDN) 2. Crude protein and feed requirements of dairy animals 3. Feed requirements based on thumb rule method 4. Feed requirements for various stages of production 5. Feed requirements based on scientific feeding standards	1. Calculate TDN of given feed stuffs 2. Formulate balanced ration using given feed stuffs using thumb rule method 3. Formulate ration for Pregnant , lactating animal and growing calf 4. Formulate balanced ration using given feed stuffs using scientific feeding standards	9
3. Identify and procure the inputs required for the feed preparation	1. Major ingredients for feed preparation 2. Average nutritive values of common feeds/ fodders	1. Enlist the major categories of feed ingredients which are used for preparation of rations 2. Identify concentrate feeds 3. Identify green fodder and straw	4
4. Arrange for various feed and feed supplements essential for animal nutrition and growth	1. Feed supplements for optimum growth and production	1. Enlist different feed supplements essential for animal nutrition and growth 2. Identification and use of given feed supplement	4

Unit 4: Provide Feed and Water for Livestock			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
5. Follow the feeding chart and store feed appropriately	<ol style="list-style-type: none"> 1. Safe and scientific storage of animal feeds. 2. Procurement, checking and receiving of animal feed in dairy farm 	<ol style="list-style-type: none"> 1. Give the flow diagram of procurement, checking and receiving of animal feeds in dairy farm. 2. Visit to dairy farm feed storage structure 	6
6. Prepare Feed with the mixture of right components or procuring quality compound feed from suppliers	<ol style="list-style-type: none"> 1. Advantages of preparing concentrate mixture at farm level 2. Preparation of feed at the farm by the dairy farmer 3. Composition of concentrate mixture 4. Steps in preparing the concentrate mixture at farm level 	<ol style="list-style-type: none"> 1. Give the flow chart of preparation of concentrate mixture at the farm level 2. Give precautions to be taken during preparation of concentrate mixture 3. Explain why concentrate mixture prepared at farm level is cheaper than concentrate mixture procured from market 4. List the basic equipment/ machines required for preparation of concentrate mixture 	6
7. Provide the feed and water to cattle	<ol style="list-style-type: none"> 1. Maintaining and monitoring feed and water supply to dairy animals 2. Water requirement of dairy animal 3. Broad plan for ensuring availability of feed , fodder and water 	<ol style="list-style-type: none"> 1. Calculate the water requirements of a dairy farm of 100 animals 2. Give a broad plan to ensure regular supply of water to dairy animal 	3

Unit 4: Provide Feed and Water for Livestock			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
	4. Salient aspects of planning feed and water supply to animals		
8. Understand wastage minimization	1. Causes of feed wastage and measures to minimize it 2. Structures for storage of feeds 3. Maintaining feed inventory	1. List the various causes of wastage of feed. 2. Explain management measures to minimize wastage of animal feed	3
Total			45

Unit 5: Forage Conservation			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
1. Gain knowledge about different Fodder crops	1. Fodder crops for dairy animals 2. Types of cultivated fodder based on : a) Season b) Amount of crude protein	1. List different fodder crops 2. Identify the given fodder and tell if the fodder belongs to Kharif, Rabi or Zaid category 3. Identify the given fodder and tell if the fodder belongs to leguminous or non-leguminous category	4
2. Understand the right time of harvesting of crops	1. Harvesting of fodder crops 2. Methods of harvesting and time of harvesting	1. Explain the stage at which the fodder crops of Jowar, Maize, Bajra, Cowpea, Berseem etc. are harvested	4
3. Identify and use the tools and	1. Equipment and machines used for		3

Unit 5: Forage Conservation			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
equipment for preparation of forages	preparation of forages	1. List the different equipment and machines for preparation of forages	
4. Understand the method of forage conservation – hay making, silage preparation, chemical treatment etc.	<ol style="list-style-type: none"> 1. Conservation of forages 2. Favourable conditions for forage conservation 3. Methods of forage conservation 	1. Visit to dairy farm to observe different methods of forage conservation	4
5. Judging the quality of conserved forage and ways to minimize environmental impact	<ol style="list-style-type: none"> 1. Methods for judging quality of the conserved silage 2. Methods for judging quality of the conserved hay 3. Proper disposal of waste and debris 	<ol style="list-style-type: none"> 1. Judge the quality of given sample of silage 2. Judge the quality of given sample of hay 	8
6. Assessing the requirements of conserved fodder	1. Factors influencing the requirement of fodder at a farm	1. Calculate the annual conserved fodder requirement for a farm of 100 cattle	2
Total			25

CLASS 12

Part A-Employability Skills

S.No.	Units	Duration (Hrs)
1.	Communication Skills	25
2.	Self-management Skills	25
3.	Information and Communication Technology Skills	20
4.	Entrepreneurial Skills	25
5.	Green Skills	15

Total	110
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Unit 1: Communication Skills – IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Total Duration (25 Hrs)
1. Describe the steps to active listening skills	1. Importance of active listening at workplace 2. Steps to active listening	1. Demonstration of the key aspects of becoming active listener 2. Preparing posters of steps for active listening	10
2. Demonstrate basic writing skills	2. Writing skills to the following: <ul style="list-style-type: none"> • Sentence • Phrase • Kinds of Sentences • Parts of Sentence • Parts of Speech • Articles • Construction of a Paragraph 	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject	15
Total			25

Unit 2: Self-management Skills – IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Total Duration (25 Hrs)
1. Describe the various factors influencing self-motivation	1. Finding and listing motives (needs and desires); 2. Finding sources of motivation and inspiration (music, books, activities);expansive thoughts; living fully in the present moment; dreaming big	1. Group discussion on identifying needs and desire 2. Discussion on sources of motivation and inspiration	10
2. Describe the basic personality traits, types and disorders	1. Describe the meaning of personality 2. Describe how personality influence others 3. Describe basic personality traits 4. Describe common personality disorders- paranoid, antisocial, schizoid, borderline, narcissistic, avoidant,	1. Demonstrate the knowledge of different personality types	

	dependent and obsessive		15
Total			25

Unit 3: Information and Communication Technology Skills - IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Total Duration (25 Hrs)
1. Perform tabulation using spreadsheet application	<ol style="list-style-type: none"> 1. Introduction to spreadsheet application 2. Spreadsheet applications 3. Creating a new worksheet 4. Opening workbook and entering text 5. Resizing fonts and styles 6. Copying and moving 7. Filter and sorting 8. Formulas and functions 9. Password protection. 10. Printing a spreadsheet. 11. Saving a spreadsheet in various formats. 	<p>1. Demonstration and practice on the following:</p> <ul style="list-style-type: none"> • Introduction to the spreadsheet application • Listing the spreadsheet applications • Creating a new worksheet • Opening the workbook and enter text • Resizing fonts and styles • Copying and move the cell data • Sorting and Filter the data • Applying elementary formulas and functions • Protecting the spreadsheet with password • Printing a spreadsheet • Saving the spreadsheet in various formats. 	10
2. Prepare presentation using presentation application	<ol style="list-style-type: none"> 1. Introduction to presentation 2. Software packages for presentation 3. Creating a new presentation 4. Adding a slide 5. Deleting a slide 6. Entering and editing text 7. Formatting text 	<p>1. Demonstration and practice on the following:</p> <ul style="list-style-type: none"> • Listing the software packages for presentation • Explaining the features of presentation 	15

	8. Inserting clipart and images 9. Slide layout 10. Saving a presentation 11. Printing a presentation document.	<ul style="list-style-type: none"> • Creating a new presentation • Adding a slide to presentation. • Deleting a slide • Entering and edit text • Formatting text • Inserting clipart and images • Sliding layout • Saving a presentation • Printing a presentation document 	
Total			25

Unit 4: Entrepreneurial Skills - IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Total Duration (25 Hrs)
1. Identify the general and entrepreneurial behavioural competencies	1. Barriers to becoming entrepreneur 2. Behavioural and entrepreneurial competencies – adaptability/decisiveness, initiative/perseverance, interpersonal skills, organizational skills, stress management, valuing service and diversity	1. Administering self-rating questionnaire and score responses on each of the competencies 2. Collect small story/ anecdote of prominent successful entrepreneurs 3. Identify entrepreneurial competencies reflected in each story and connect it to the definition of behavioural competencies 4. Preparation of competencies profile of students	10
2. Demonstrate the knowledge of self-assessment of behavioural competencies	1. Entrepreneurial competencies in particular: self - confidence, initiative, seeing and acting on opportunities, concern for quality, goal setting and risk taking, problem solving and creativity, systematic planning and	1. Games and exercises on changing entrepreneurial behaviour and development of competencies for enhancing self-confidence, problem solving, goal setting,	15

Unit 4: Entrepreneurial Skills - IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Total Duration (25 Hrs)
	efficiency, information seeking, persistence, influencing and negotiating, team building	information seeking, team building and creativity	
Total			25

Unit 5: Green Skills - IV			
Learning Outcome	Theory (05 hrs)	Practical (10 hrs)	Total Duration (15 Hrs)
1. Identify the role and importance of green jobs in different sectors	<ol style="list-style-type: none"> 1. Role of green jobs in toxin-free homes, 2. Green organic gardening, public transport and energy conservation, 3. Green jobs in water conservation 4. Green jobs in solar and wind power, waste reduction, reuse and recycling of wastes, 5. Green jobs in green tourism 6. Green jobs in building and construction 7. Green jobs in appropriate technology 8. Role of green jobs in Improving energy and raw materials use 9. Role of green jobs in limiting greenhouse gas emissions 10. Role of green jobs minimizing waste and pollution 11. Role of green jobs in protecting and restoring ecosystems 12. Role of green jobs in support adaptation to the effects of climate change 	<ol style="list-style-type: none"> 1. Listing of green jobs and preparation of posters on green job profiles 2. Prepare posters on green jobs. 	15

Total			15
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Part B–Vocational Skills

S.No.	Units	Duration (Hrs)
1.	Maintain Healthy Performance of Livestock	35
2.	Performing Hand and Machine Milking	40
3.	Entrepreneurship	45
4.	Maintain Health and Safety at the Workplace	45
	Total	165

Unit 1: Maintain Healthy Performance of Livestock			
Learning Outcome	Theory (10 hrs)	Practical (25 hrs)	Duration (35 Hrs)
1. Understand the healthy animal parameters	1. Signs of healthy and unhealthy animals	1. Compare healthy and unhealthy animal on various parameters 2. Visit to dairy farm for comparison of healthy and unhealthy animals	5
2. Treat animals as per animal welfare regulations.	1. Concept of wellbeing of animals 2. Concept of animal welfare 3. Animal welfare regulations	1. Explain the difference between animal wellbeing and animal welfare 2. Visit to dairy farm to explain to the students the various wellbeing and welfare measures being adopted for the animals 3. Explain the five basic freedoms for livestock animals	4
3. Monitor the physical condition of the animals at suitable	1. Routine monitoring and	1. List the various aspects of routine	4

Unit 1: Maintain Healthy Performance of Livestock			
Learning Outcome	Theory (10 hrs)	Practical (25 hrs)	Duration (35 Hrs)
intervals, and recognize, record and report any abnormal signs	<ul style="list-style-type: none"> reporting of physical condition of the animals 2. Abnormal behaviour of dairy animals 	<ul style="list-style-type: none"> monitoring of physical conditions of animals 2. List the common vices and abnormal behaviours in farm animals 	
4. Check livestock for presence of external parasites	<ul style="list-style-type: none"> 1. Importance of external parasites 2. Effects of external parasites on animals 3. Prevention of external parasites 4. Treatment and control of external parasites 	<ul style="list-style-type: none"> 1. Visit to dairy farm for observing animals infested with external parasites and how they are controlled 	3
5. Understand the health maintenance procedure of livestock	<ul style="list-style-type: none"> 1. Management interventions to maintain health and productivity of livestock 	<ul style="list-style-type: none"> 1. List the important management interventions to maintain health and productivity of livestock 	3
6. Understand the pregnancy in farm animals	<ul style="list-style-type: none"> 1. Heat detection techniques 2. Artificial Insemination (AI) 3. Diagnosis of pregnancy and management of pregnant animals 	<ul style="list-style-type: none"> 1. Visit to dairy farm to understand management of animals in heat 2. Popular heat detection technique being practiced at dairy farm 3. Visit to dairy farm for students to observe the process of AI 4. Repeat visit to farm to observe pregnancy in animals 	4

Unit 1: Maintain Healthy Performance of Livestock			
Learning Outcome	Theory (10 hrs)	Practical (25 hrs)	Duration (35 Hrs)
7. Take Care during Pregnancy	1. Management of pregnant animals	1. Visit to the dairy farm to help the student understand various aspects of management of pregnant animal such as nutrition, accommodation etc.	4
8. Understand handling of calves	1. Management of calves 2. Importance of colostrum feeding 3. Substitute for colostrum 4. Housing, weaning and feeding schedule of calves 5. Composition of calf starter 6. Dehorning methods 7. Castration of calves	1. Visit to dairy farm to observe management of calves such as housing, hygiene, colostrum feeding etc. 2. Prepare substitute for colostrum 3. How the student will teach the calf to drink milk 4. Give a feeding schedule of calf up to age of 3 months 5. Explain advantages of weaning of calves	4
9. Record the health checkup of the animal and treatment provided	1. Model format for maintenance of health and treatment of animals	1. Explain the importance of maintenance of health record of animals	4
Total			35

Unit 2: Performing Hand and Machine Milking			
Learning Outcome	Theory (10 hrs)	Practical (30 hrs)	Duration (40 Hrs)
1. Understand the pre-milking, milking and post	1. Structure of udder 2. Physiology of milk letdown	1. Draw outline diagram of mammary gland 2. Give the flow	11

Unit 2: Performing Hand and Machine Milking			
Learning Outcome	Theory (10 hrs)	Practical (30 hrs)	Duration (40 Hrs)
milking activities	3. Inhibition of milk letdown 4. Pre milking activities 5. Milking methods 6. Post milking activities	chart of milk letdown 3. Visit to dairy farm to observe various pre milking, milking and post milking activities	
2. Understand the Mastitis disease and precautions to be taken	1. Mastitis and its importance 2. Mastitis detection methods 3. Control and prevention of mastitis	1. Differentiate between clinical and subclinical mastitis 2. Visit to dairy farm to observe various mastitis detection methods 3. Visit to dairy farm to observe precautions taken for mastitis	7
3. Identify and use the milking machine and equipment	1. Parts of milking machine and their functions	1. Visit to dairy farm to observe various equipment of a milking machine	6
4. Understand the adjustments of the machine and equipment	1. How milking machine works	1. Visit to dairy farm to observe parts of the milking machine and their functions	6
5. Understand the right milking technique	1. Methods of milking 2. Full hand milking versus stripping and knuckling methods	1. Visit to dairy farm to help the students observe right techniques of milking	5
6. Follow procedure for clean milk production	1. Sources of contamination in milk 2. Steps of clean milk production	1. List the various sources of contamination of milk 2. List the steps of clean milk production during : a) Before milking b) During milking c) After milking	5
Total			40

Unit 3: Entrepreneurship			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
1. Understand the dairy farming economics and finance	<ol style="list-style-type: none"> 1. Laws of dairy economics 2. Entrepreneurship opportunities in dairy sector 3. Peculiar economic facts in dairy sector 4. Factors influencing economics of dairy farming 	<ol style="list-style-type: none"> 1. Explain the areas in which an entrepreneur needs help after completion of training 	10
2. Collect information on financing institutions for dairy farming	<ol style="list-style-type: none"> 1. Institutional finance for dairy farming 2. Common lending terms and conditions of financial institutions 	<ol style="list-style-type: none"> 1. Explain the concept of Net present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Profitability ratio (PR) 	6
3. Estimate the budget for dairy farming	<ol style="list-style-type: none"> 1. Planning a dairy business 	<ol style="list-style-type: none"> 1. Prepare a business plan for starting a dairy farm of 10 animals 	8
4. Understand and update the market information	<ol style="list-style-type: none"> 1. Market information updates with special focus on e-marketing 2. Importance of market information of inputs and outputs 	<ol style="list-style-type: none"> 1. Prepare a report of quarterly fluctuations in major inputs and outputs in dairy sector 	6
5. Manage the records of the Business	<ol style="list-style-type: none"> 1. Importance of record keeping 	<ol style="list-style-type: none"> 1. Use the dairy farm records in the preparation of a project for loan for dairy farm for 10 cattle 	5
6. Understand the method of marketing	<ol style="list-style-type: none"> 1. Marketing of milk and milk products 	<ol style="list-style-type: none"> 1. Enumerate the different ways of marketing of milk 	5
7. Develop contact with market players	<ol style="list-style-type: none"> 1. Developing confidence with other market players 	<ol style="list-style-type: none"> 1. Enumerate the clients of a dairy farm 	5
			45

Unit 4: Maintain Health and Safety at the Workplace			
Learning Outcome	Theory (20 hrs)	Practical (25 hrs)	Duration (45 Hrs)
1. Maintain a clean & efficient workplace	<ol style="list-style-type: none"> 1. Importance of cleanliness and hygiene at the work place 2. Safe handling of equipment and animals 	<ol style="list-style-type: none"> 1. Explain the various handling risks 	15
2. Render appropriate emergency measures	<ol style="list-style-type: none"> 1. Prevention of transmission of infectious diseases and first aid measures 2. First aid measures in instances of poisoning, sun-stroke, electrocution, burn injuries and prolapse of uterus etc. in dairy animals 	<ol style="list-style-type: none"> 1. Prepare potassium permanganate solution 2. Explain first aid to be given to animal in cases of electrocution, poisoning, burning and accidental emergency 	15
3. Practice General safety and first aid	<ol style="list-style-type: none"> 1. First aid for dairy animals 2. Maintaining hygiene and bio security at dairy farm, and disposal of carcass 	<ol style="list-style-type: none"> 1. Suggest the items for a first aid kit for dairy animals 2. List out the important methods of disposal of carcass 	15
Total			45

6. ORGANISATION OF FIELD VISITS

In a year, at least 10 visits to a nearby dairy farm/educational tours should be organised for the students to expose them to the various routine activities undertaken at a good dairy farm.

Visits to a nearby dairy farm should facilitate the students to observe for themselves the following:

Location, Site, Isolation room, Quarantine room, calf room, ration room, heifer room, calving box, young animal room, bull shed, travis, sick animal and veterinary dispensary, post-mortem platform, concentrate and fodder godowns, chaffing shed, silo pits, milk house, manure disposal area, During the visit, students observe and obtain the following information from the owner or the supervisor of the dairy:

1. Understand management of animals in heat.
2. Identification of various breeds of cattle and buffalo.
3. Identification of various breeds of cattle and buffalo improved through the technique of selection.
4. Understand the need for livestock housing.
5. Understand the optimization of available resources at the farm and housing needs of animals.
6. Check if equipment, materials and accommodation are suitable for reception of the livestock, prior to their arrival.
7. Dairy farm feed storage structures.
8. Comparison of healthy and unhealthy animals.
9. Various wellbeing and welfare measures being adopted for the animals.
10. Animals infested with external parasites and how they are controlled.
11. Understand management of animals in heat.
12. Understand various aspects of management of pregnant animal such as nutrition, accommodation etc.
13. Observe management of calves such as housing, hygiene, colostrum feeding etc.
14. Observe various pre milking, milking and post milking activities.
15. Various mastitis detection methods.
16. Precautions taken for mastitis.
17. Various equipments of a milking machine.
18. Parts of the milking machine and their functions.
19. Different methods of forage conservation.

7. LIST OF EQUIPMENT AND MATERIALS

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the schools so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

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|--------------------------------|--|
| 1. Electric dehorner | 13. Metal chains |
| 2. Burdizzo castrator | 14. Bull nose ring |
| 3. Tagging set | 15. Bull nose punch |
| 4. Tattooing set | 16. Bull leader |
| 5. Branding numbers | 17. Animal awakener |
| 6. Drenching bottles | 18. Artificial insemination (AI) cylinder with liquid nitrogen and semen straw |
| 7. Mouth gags | 19. AI gun |
| 8. Muzzle | 20. Hose pipe |
| 9. Housing models | 21. Grooming brush |
| 10. Models of different breeds | 22. Various feeds and fodders |
| 11. Hoof trimmer | |
| 12. Ropes | |

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|---------------------------|--|
| 23. Measuring appliances | 33. Trocar and cannula |
| 24. Milking bucket | 34. Apron |
| 25. Post milking teat dip | 35. Gloves- 25 pair |
| 26. Milk can | 36. Gumboots- 25 pair |
| 27. Milk strainer | 37. Masks- 100 |
| 28. Broom | 38. Dangris - 25 |
| 29. Disinfectants | 39. CMT reagent and CMT Paddle for detection of mastitis |
| 30. bull exerciser | 40. Ph strips |
| 31. Medicines | |
| 32. Thermometer | |

8. VOCATIONAL TEACHER'S/ TRAINER'S QUALIFICATION AND GUIDELINES

Qualification and other requirements for appointment of vocational teachers/trainers on contractual basis should be decided by the State/UT. The suggestive qualifications and minimum competencies for the vocational teacher should be as follows:

S.No.	Qualification	Minimum Competencies	Age Limit
1.	Post-graduation in Dairying/ Animal Husbandry from a recognized Institute /University, with at least 1 year work experience	<ul style="list-style-type: none"> • Effective communication skills (oral and written) • Basic computing skills 	18-37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules

9. LIST OF CONTRIBUTORS

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