



Savitribai Phule Pune University, Pune

(Formerly, University of Pune)

Under Graduate Degree Program in Science

(Faculty of Science and Technology)

Revised Structure as per National Education Policy (2020) for

T.Y.B.Sc. Restructuring Pattern Structure

(Semester-V and VI)

(This Syllabus is only applicable for Restructuring Colleges only Affiliated to Savitribai Phule Pune University, Pune)

To be implemented from

Academic Year 2026-27

Framed by

BOARD OF STUDIES IN RESTRUCTURING PATTERN

Savitribai Phule Pune University,

Ganeshkhind, Pune -07.

AIMS AND OBJECTIVES

- To develop employability oriented diversified course content.
- To introduce skill oriented specialized education.
- To expose students to basic and applied knowledge of skill course.

1. Title of the Course: B.Sc. Restructuring Pattern (03 years)

**Syllabus revised as per National Education Policy (NEP) 2020 for the
(This Syllabus is only applicable for Restructuring Colleges only Affiliated to Savitribai
Phule Pune University, Pune)**

2. Faculty – Science (Science and Technology)**3. To be implemented -For T.Y.B.Sc. Restructuring Pattern (Semester V and Semester VI) from June 2026.****4. Preamble**

In accordance with the restructuring pattern of undergraduate education sanctioned by the University Grants Commission, the Government of Maharashtra and University of Pune during the academic year 1984–85, the present syllabus has been designed with a strong emphasis on skill enhancement, vocational training and practical knowledge. The course structure aims to bridge the gap between theoretical education and employability by introducing project oriented and practical based learning methodologies. This restructuring initiative was undertaken to equip students with technical competence, self-employment opportunities and industry-relevant skills in emerging applied sciences and vocational disciplines.

The syllabus incorporates multidisciplinary technical courses such as Pharmaceutical Chemistry, Soap Manufacturing, Energy Studies, Radio Repairing, Nursery Development, Horticulture and its Management, Applied Entomology, Medical Laboratory Technology, Dairy Science and Milk & Milk Products Technology. The curriculum is carefully framed to provide hands on training, field exposure, laboratory practice and project work so that students may develop scientific aptitude, technical proficiency and entrepreneurial capabilities. The overall objective of the programme is to promote need based education and prepare students for gainful employment, rural development and small scale industrial opportunities in accordance with the educational reforms introduced under the restructuring pattern.

5. Program Duration and Exit Options

The UG Program lasts for four years or six semesters. Student may leave the program after the third year if, he/she would like to receive a three-year undergraduate degree. If the student decides to withdraw after the first or second year, he/she will receive a UG Certificate or UG Diploma, depending on how many credits he/she is able to complete. Re-entering within three years to finish

the degree program is allowed for students who leave with a UG certificate or UG diploma. A student must earn a minimum of 18 credits and a maximum of 26 credits each semester. It is recommended, nevertheless, that student should opt 22 credits per semester. This clause aims to give student the comfort of a flexible semester-based course load. However, Table 1 lists the minimum number of credits required to be earned in order to be awarded an Undergraduate Certificate/Undergraduate Diploma/Bachelor Degree/Bachelor's Degree.

Table1: Type of Awards and Stages of Exit

Sr. No	Type of Award	Stage of Exit	Mandatory Credits
1.	Undergraduate certificate in Major core course subject (Botany/Physics/Chemistry/Zoology Subject) with Restructuring courses	After successful completion of First year Semesters	44
2.	Undergraduate Diploma in Botany/Physics/Chemistry/Zoology Subject with Restructuring courses	After successful completion of Second year Semesters	88
3.	Bachelor of Science in Botany/Physics/Chemistry/Zoology Subject with Restructuring courses	After successful completion of Third year Semesters	132

6. Eligibility Criteria –

The basic criteria for Under Graduate Degree T.Y.B.Sc. Restructuring pattern course subject pass/ATKT with SYBSc restructuring pattern course subject. Admissions will be given as per the selection procedure / policies adopted by the college keeping in accordance with the conditions laid down by the Savitribai Phule Pune University, Pune. Reservation and relaxation are as per the State Government rules.

7. Fee Structure – As per the norms of Savitribai Phule Pune University, Pune.

8. Duration of the Course

Certificate Course- 01 year (Completion of 02 Semesters)

Diploma Course- 02 years (Completion of 04 Semesters)

BSc. Degree- 03 years (Completion of 06 Semesters)

9. No. of semesters – Two semesters per year

10. Medium of instructions and teaching: English

11. Course Implementation criteria for Theory and Practical:

- Each semester comprises of 15 weeks (12 weeks Actual Teaching + 3 weeks for Continuous Internal Evaluation).

- b. **One Credit of the Theory** is equal to 15 clock hours (Teaching 1 hour per week for each credit, 12 hours Actual Teaching + 3 hours Continuous Internal Evaluation – Assignments, Tutorials, Practice, Problem solving sessions, Group discussion, Seminars and Unit Tests.
- c. **One Credit of Practical** = 30 clock hours. (2 Contact hours per credit per week) One Credit = 30 clock hours (24 hours' Actual Table work + 6 hours for journal competition, and Continuous Internal Evaluation of each practical).
- d. Practical for each course comprises of 02 Credits = 60 clock hours. Therefore,
- Minimum 12 laboratory/ Filed sessions of 04 clock hours must be conducted in one semester.
 - In case of short practical, two practicals should be conducted in one session.
 - Each practical of 04 clock hours in the laboratory should consist of: Table performance for concerned practical, careful observations, calculation, writing results and conclusion, and submission of practical in written form.
 - Pre-laboratory reading and post laboratory assignments should be given on each practical as a part of continuous internal evaluation.

12. Examination Pattern (For each Semester): The examinations will be conducted

Semester wise for both Theory as well as Practical courses.

- Theory Paper of 02 Credits -
 - Internal Exam (15 M) + University Theory Exam (35 M) = Total 50 M
 - Duration: For Internal exam = 40 Min. and For University Exam = 02 hours.
- Practical Paper of 2 Credits -
 - Internal Exam (15 M) + University Practical Exam (35 M) = Total 50 M
 - Duration: For Internal exam = 40 Min. and For University Exam = More than 04 hours.
- **Field Project: 02 credits**

Student field project should be evaluated for total 50 marks (15 marks for internal and 35 marks for external evaluation). During internal assessment following points should be considered

 1. Appropriateness of the field project
 2. Punctuality of the student
 3. Field work
 4. Field Dairy
 5. Viva voce

The criteria for external evaluation should be

1. Originality and significance of the project, its relevance to the field, and potential impact.
2. Soundness of methodology, research design, and approach.
3. Quality, accuracy, and thoroughness of data collection, analysis, and interpretation.
4. Validity and significance of findings, conclusions, and recommendations.
5. Clarity, organization, and effectiveness of the project report and presentation.

- **Community Engagement Program (CEP): 02 Credits**

Student Community Engagement Program (CEP) shall be evaluated for total 50 marks (15 marks for internal and 35 marks for external evaluation). During internal assessment following points shall be considered

1. Effectiveness of program design and planning.
2. Student participation and engagement in program activities.
3. Effectiveness of student communication with community members.
4. Demonstration of seed technology knowledge and skills.
5. Maintenance of program records and documentation.

The criteria for external evaluation shall be

1. Clarity, organization, and effectiveness of the report and presentation.
2. Assessment of the program's impact on the local community.
3. Evaluation of student learning outcomes and skills development.
4. Assessment of the program's effectiveness in achieving its objectives.

13. Award of Class/Grade: The class / grade for the courses of each semester will be followed as per the norms and conditions laid down by SPPU, Pune.

14. ATKT Rules: As per the norms given by SPPU, Pune.

15. Important Note:

- a. There shall be at least a short tour/field visit/industrial visit (1-2 days) per year for all UG students. Tours are the part of curriculum and obligatory to each student, failing which they will not be considered eligible to appear for the practical examination. Under unavoidable circumstances, if the student fails to attend the tour, he/she have to produce justifiable evidence for not attending the tour. However, in lieu of tour the candidate will have to complete the work assigned by the Department.
- b. The documents to be produced by each student at the time of practical Examination (at the end of each Semester) are:
 - Submission of practical records compulsory (Journals).
 - Submission of a Tour / Visit report duly signed by the concerned practical In-charge and Head of the Department.
 - Any submissions / assignments, etc. based on the practical course.

16. Question paper pattern for Theory (2 Credit courses)

A student will have to solve the question paper of 35 marks for external exam. The paper setter should set the paper on entire syllabus, including optional questions. As the course is of 2 Credits (30 clock hour lectures), paper setter should allot 1.16 marks per lecture and accordingly, questions should be set for 30 lectures, 35 marks on entire syllabus.

- **Note: All questions are compulsory.**
- **Time: 2 Hours**

Que. 1) Answer any five of the following in one sentence	05 Marks
i.	
ii.	
iii.	
iv.	
v.	
vi.	
Que. 2a) Write any one of the following	06 Marks
i.	
ii.	
Que. 2b) Write any one of the following	04 Marks
i.	
ii.	
Que. 3a) Solve any one of the following	06 Marks
i.	
ii.	
Que. 3b) Solve any one of the following	04 Marks
i.	
ii.	
Que. 4) Write notes on (Any four)	10 Marks
a.	
b.	
c.	
d.	
e.	
f.	

CREDIT FRAME WORK FOR T.Y.B.Sc. RESTRUCTURING PATTERN, SEMESTER-V

Course details		Course code	Course title	Credits
Vertical-1(V1)				
Discipline Specific Core (DSC) Major Core Courses – (4T + 2P) x 2C = 12C	8 (T)	As per Major Subjects groups Theory Botany/Physics/Chemistry/Zoology Subject		8 C
	4 (P)	As per Major Subjects groups Practical Botany/Physics/Chemistry/Zoology Subject		4 C
Major Elective Courses – 1 T+1 P=4C	2(T)+2(P)	As per Major Elective groups Theory & Practical Botany/Physics/Chemistry/Zoology Subject		4 C
Vertical – 2 (V2)				
Minor Courses	1T	2(T] As per Minor Subjects groups Botany/Physics/Chemistry/Zoology Subject		2 C
Vertical-3(V3)				
Generic Elective(GE) / Open Elective (OE)	--		----	0C
Vertical-4(V4)				
Vocational Skill Courses (VSC) –(1T = 2C/P) (Any one from basket)	VSC-321-RE-PC-T	Pharmaceutical Chemistry-III		2C
	VSC-322-RE-ES-T	Energy Studies-III		
	VSC-323-RE-HM-T	Horticulture and Its Management –III		
	VSC-324-RE-AE-T	Applied Entomology-III		
	VSC-325-RE-DS-T	Dairy Science-III		
Skill Enhancement Courses	-----	-----		0 C
FP/OJT/CEP Field Project FP 2C	FP-331-RE-PC	Pharmaceutical Chemistry - Project		2 C
	FP-332-RE-ES	Energy Studies- Project		
	FP-333-RE-HM	Horticulture and Its Management- Project		
	FP-334-RE-AE	Applied Entomology- Project		
	FP-335-RE-DS	Dairy Science- Project		
Vertical-5(V5)				
Indian Knowledge Systems (IKS) – (1T=2C)(Anyone From basket)				0C
	-----	----		
Ability Enhancement Courses (AEC)– (1T=2C)	-----	-----		0C
Value Education Courses(VEC)	-----	-----		0C
Vertical-6(V6)				
Co-curricular Courses (CC) –(1T=2C) (Anyone From basket)	----	-----		0 C
Total Credits (V1+V2+V3+V4+V5+V6)				22 C

CREDIT FRAME WORK FOR T.Y.B.Sc. RESTRUCTURING PATTERN, SEMESTER-VI

Course details		Cours e code	Course title	Credits	
Vertical-1(V1)					
Discipline Specific Core (DSC) Major Core Courses – (4T + 2P) x 2C = 12C	8 (T)	As per Major Subjects groups Theory Botany/Physics/Chemistry/Zoology Subject		8 C	
	4 (P)	As per Major Subjects groups Practical Botany/Physics/Chemistry/Zoology Subject		4 C	
Major Elective Courses – 1 T+1 P=4C	2(T)+2(P)	As per Major Elective groups Theory & Practical Botany/Physics/Chemistry/Zoology Subject		4 C	
Vertical – 2 (V2)					
Minor Courses	1T	----		0 C	
Vertical-3(V3)					
Generic Elective(GE) / Open Elective (OE)	--	----		0C	
Vertical-4(V4)					
Vocational Skill Courses (VSC) –(1T = 2C/P) (Any one from basket)	VSC-371-RE-PC-P	Pharmaceutical Chemistry-IV		2C	
	VSC-372-RE-ES-P	Energy Studies-IV			
	VSC-373-RE-HM-P	Horticulture and Its Management –IV			
	VSC-374-RE-AE-P	Applied Entomology-IV			
	VSC-375-RE-DS-P	Dairy Science-IV			
Skill Enhancement Courses	-----	-----		0 C	
FP/OJT/CEP Community Engagement program 4C (CEP)	CEP-381-RE-PC	Pharmaceutical Chemistry		4 C	
	CEP-382-RE-ES	Energy Studies			
	CEP-383-RE-HM	Horticulture and Its Management			
	CEP-384-RE-AE	Applied Entomology			
	CEP-385-RE-DS	Dairy Science			
Vertical-5(V5)					
Indian Knowledge Systems (IKS) –(1T=2C)(Anyone From basket)				0C	
	-----	----			
Ability Enhancement Courses (AEC)– (1T=2C)	-----	----		0C	
Value Education Courses(VEC)	-----	-----		0C	
Vertical-6(V6)					
FP/OJT /CEP	-----	-----		0C	
Co-curricular Courses (CC) –(1T=2C) (Anyone From basket)	----	-----		0ccccl;x..... ppp C	
Total Credits (V1+V2+V3+V4+V5+V6)					22 C

Exit Option: Award of UG Degree (UG Degree Course in As per Botany/Physics/Chemistry/Zoology Subject) in Major and Minor with 44 Credits and an additional 4 Credits core NSQF course / Internship OR Continue with Major and Minor with restructuring pattern course.

Courses offered by the TYBSc Restructuring Pattern

Year	Semester	Course Code	Course Title
Vocational Skill Courses (VSC) –(1T = 2C) (Any one from basket)			
T.Y.B.Sc.	V	VSC-321-RE-PC-T	Pharmaceutical Chemistry-III
	V	VSC-322-RE-ES-T	Energy Studies-III
	V	VSC-323-RE-HM-T	Horticulture and Its Management –III
	V	VSC-324-RE-AE-T	Applied Entomology-III
	V	VSC-325-RE-DS-T	Dairy Science-III
FP/OJT/CEP Field Project (FP) 2C (Any one from basket)			
T.Y.B.Sc.	V	FP-331-RE-PC	Pharmaceutical Chemistry – Project
	V	FP-332-RE-ES	Energy Studies- Project
	V	FP-333-RE-HM	Horticulture and Its Management- Project
	V	FP-334-RE-AE	Applied Entomology- Project
	V	FP-335-RE-DS	Dairy Science- Project
Vocational Skill Courses (VSC) – (1P = 2C) (Any one from basket)			
T.Y.B.Sc	VI	VSC-371-RE-PC-P	Pharmaceutical Chemistry-IV
	VI	VSC-372-RE-ES-P	Energy Studies-IV
	VI	VSC-373-RE-HM-P	Horticulture and Its Management –IV
	VI	VSC-374-RE-AE-P	Applied Entomology-IV
	VI	VSC-375-RE-DS-P	Dairy Science-IV
FP/OJT/CEP Community Engagement Program 4C (CEP) (Any one from basket)			
T.Y.B.Sc	VI	CEP-381-RE-PC	Pharmaceutical Chemistry -CEP
	VI	CEP-382-RE-ES	Energy Studies-CEP
	VI	CEP-383-RE-HM	Horticulture and Its Management-CEP
	VI	CEP-384-RE-AE	Applied Entomology-CEP
	VI	OJT-385-RE-DS	Dairy Science-CEP

Savitribai Phule Pune University, Pune
T. Y. B.Sc. Restructuring Pattern Syllabus (as per NEP-2020)
Syllabus from June 2026

SEMESTER- V
Course Category-Vocational Skill Course (VSC)
Course Code-VSC-321-RE-PC-T
Paper Title: Pharmaceutical Chemistry –III
Theory (Credit 2) No. of Hours: 30 Hours

Course Outcomes (COs)

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

- CO 1:** Fundamentals of Pharmaceutical Chemistry: Understand the basic concepts of pharmaceutical chemistry, including: Drug classification, Sources of drugs, Drug nomenclature and pharmacopoeias.
- CO 2:** Knowledge of Therapeutic Drug Classes, Describe synthesis, mechanism of action, and uses of major drug classes: Antimicrobials, Analgesics, Cardiovascular drugs, CNS-active drugs
- CO 3:** Mechanism and Application of Drugs, Analyze the mechanism of action and therapeutic applications of important drugs such as
- CO 4:** Pharmaceutical Formulations, Explain formulation principles of: Tablets, capsules, syrups, injections, Role of excipients and additives.
- CO 5:** Laboratory Skills, Perform and interpret experiments related to: Preparation and assay of drugs Identification tests, Chromatographic separation techniques.
- CO 6:** Environmental & Safety Awareness Recognize: Safe handling of pharmaceutical chemicals, Environmental impact of drugs and waste.

SYLLABUS

Sr. No.	Chapter Name	Number of Lecture
1	Sources of drugs	5
2	Pharmacokinetics and pharmacodynamics	5
3	Pharmaceutical formulation	6
4	Organic drug synthesis	8
5	Introduction to biomolecules	6
Total		30

1. SOURCES OF DRUGS**(5 L)**

Definition of drug, Sources of drugs: natural, synthetic, animals, minerals, micro-organisms, Drugs produced by genetic engineering, Pharmacologically active principles in plants: alkaloids, glycosides, oils, gums, resins, tannins, antibacterial substances etc., Classification of drugs, The Drugs and Cosmetics Act.

2. PHARMACOKINETICS AND PHARMACODYNAMICS-**(5 L)**

Definition of Pharmacokinetics: absorption, distribution, metabolism and excretion of drugs and their relationship to pharmacologic responses. Definition of Pharmacodynamics: its importance in use of drug, types of drug action.

3. PHARMACEUTICAL FORMULATION**(6 L)****a) Oral dosage forms:**

- i) Tablet: definition, types of tablet, additives of compressed tablet
- ii) Capsules: definition, types of tablet, additives of compressed capsules
- iii) Liquid orals: Monophasic, biaphasic (emulsion & suspension) additives in liquid orals

b) Parenteral formulation:

Additives in intravenous (IV), intramuscular (IM), subcutaneous.

c) Topical-

- i) Semisolid-additives in ointment, cream, paste and gels.
- ii) Liquid- additives in lotion, liniment, mouth wash.

4. ORGANIC DRUG SYNTHESIS:**(8 L)**

Synthesis and uses of Paracetamol, Sulphonamide, Benzocaine, Aspirin, Chloramphenicol

5. INTRODUCTION TO BIOMOLECULES**(6 L)**

Definition of biochemistry, importance of biochemistry

a) Amino acids: Introduction, classification, reaction of amino acid.

b) Carbohydrates: Introduction, classification, daily requirement, functions

c) Proteins: Introduction, structure of protein, classification of protein.

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SEMESTER- V
Course Category-Vocational Skill Course (VSC)
Course Code-VSC-321-RE-ES-T
Paper Title: Energy Studies –III
Theory (Credit 2) No. of Hours: 30 Hours

Course Objectives

- CO1.** To study the types of concentrators.
- CO2.** To study the photovoltaic effect and its principle.
- CO 3.** To study energy storage & wind energy.
- CO 4.** To study energy conservation & other renewable energy sources.

Detailed Syllabus:

Unit No.	Name of the Topic	Lectures Allotted
	Credit-1	15L
1	Solar concentrators and Photovoltaic devices: - Basic definitions: Aperture, Acceptance angle, Concentration ratio - Types of concentrator: - Compound Parabolic Concentrator (CPC) & Cylindrical Parabolic Concentrator (Parabolic trough) - Central receiver collector, Fresnel lens - Photovoltaic principle, solar cell: Construction, I-V characteristics, fill factor and efficiency. - Parameters affecting efficiency of solar cell, types of solar cells, - Applications of solar cell - PV panel and small capacity power generation.	08L
2	Biomass: - Photosynthesis and generation of biomass - Routes of utilization of biomass- Direct combustion - Bio thermal-pyrolysis and gasification - Biochemical fermentation, study of biogas plant and its types.	07L
	Credit-2	15L
3	Energy storage and Wind energy - Need of energy storage - Types of Energy storage- Thermal, electric, chemical and hydro storage, solar pond as storage of energy - Estimation of energy obtained from wind, velocity and power duration curves - Types of wind driven machines- Horizontal and vertical axis	08L

	type, performance, merits and demerits	
4	Energy conservation and other renewable sources of energy: • Need for energy conservation • Principle of energy conservations • Concept of energy audit • Hydrogen as a potential sources of energy, • production and storage of hydrogen • fuel cells • Batteries: Lithium-ion battery and nuclear battery	07L

Reference Books:-

1. Non-conventional energy Resources :B.H. Khan (Tata McGraw-Hill Co.)
2. Solar Energy :S.P. Sukhatme (Tata McGraw-HillCo.)
3. Solar Energy Utilization: G.D Rai (Khana Publishers)
4. Encyclopedia of Energy 2 ndEdition : (Tata McGraw-HillCo.)
5. Energy resources: Andrew I. Simon (Pergamon Press)
6. Solar Energy: H.P. Garg
7. Solar Energy: G.N. Tiwari (Narosa publishing house)
8. Energy Resources: Demand and conservation: Chaman Kashkari
9. Alternative energy sources: James P. Hartnet(Academic Press ,Newyork)

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T.Y.BSc. Restructuring Pattern Syllabus (as per NEP-2020) Syllabus from June 2026

SEMESTER- V

Course Category-Vocational Skill Course (VSC)

Course Code-VSC-321-RE-HM-T

Paper Title: Horticulture & its Management-III

Theory (Credit 2) No. of Hours: 30 Hours

Course Objectives:

1. To introduce students about the Scope and importance of horticultural crops
2. To Familiarize students about Soil and climate requirement for horticultural crops
3. To develop knowledge about Commercial cultivation of following fruit crops
4. To create awareness about fruit production technology
5. To introduce students about Different Production System and Modern Methods of Vegetable Cultivation
6. To develop knowledge about Commercial vegetable cultivation

Course Outcomes:

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

CO1: Explain the scope and importance of horticultural crops

CO2: Promoting macro and micro propagation methods

CO3: Describe the commercial cultivation of fruit crops

CO4: Apply different Production System and Modern Methods of Vegetable Cultivation

CO5: Understand the vegetable Crops fresh, raw, and processed products

CO6: Develop knowledge on industrial entrepreneurial skills related to Fruit and Vegetable.

Sr. No.	Topic Details	No. of Lectures
	Credit-I	15L
1	Chapter-1: Introduction a) Scope and importance of horticultural crops	1L
2	Chapter-2: Scenario of horticulture a) Global and national scenario of horticulture	1L
3	Chapter-3: Horticultural zones a) Horticultural zones of India and Maharashtra	1L
4	Chapter-4: Soil and climate requirement for horticultural crops a) Soil requirement -Physical ,chemical and biological properties of soil, b) Climatic requirement- temperature light humidity rainfall and any other	2L
5	Chapter-5: Macro and Micro propagation methods. a) Macro and Micro propagation methods. b) Advantages and disadvantages of macro and micro propagation methods	2L
6	Chapter-6: Commercial cultivation of fruit crops a) Commercial cultivation of following fruit crops in relation to Importance, climate and soil, varieties, raising of seedling, plantation season, preparation of land and types of layouts, Fertilizers & irrigation, special practices, use of growth hormones, virus, pest and diseases management, harvesting, storage and marketing. 1.Sapota 2.Guava 3.Banana 4.Pomogranet 5.Apple 6.Lemon	6L
7	Chapter-7: Fruit production Technology a) Preparation of different fruit products jam, jelly, marmalade, ketchup	2L
	Credit-II	15L
8	Chapter-8: Different Production System of Vegetable a) Modern Methods of Vegetable Cultivation	1L
9	Chapter-9: Importance of vegetable cultivation in India a) Industrial Importance of Vegetables and Setting up of Industry Based on Vegetable Crops	1L

10	Chapter-10: Commercial cultivation of Vegetable a) Importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following cole crops: Cultivation of (a) Cabbage and (b) Cauliflower	4L
11	Chapter-11: cultivation of Leguminous vegetable crops a) Importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of Leguminous vegetable crops: Cultivation of (a) Cluster bean (b) Cow pea and (d) Dolichos	4L
12	Chapter-12: Seed extraction in Vegetable Crops a) Seed extraction methods in Tomato and Brinjal b) Seed storage methods	1L
13	Chapter-13: Vegetable Crop products a) Vegetable Crops fresh products, Raw products and processed products- b) Powdered: Pumpkin Flake, Tomato Powder, Onion Powder, Garlic Powder, Ground Ginger Powder c) Freeze-Dried:-Onion - <i>Minced, Sliced, Toasted, Diced</i> ,Garlic, Carrots	3L

Reference Books :

1. Chadha, K.L. (ICAR) 2002, 2001. Hand book of Horticulture. ICAR, New Delhi.
2. Chundawat, B.S. 1990. Arid fruit culture. Oxford and IBH, New Delhi
3. Ganner, R.J. and Choudhri, S.A. 1972. Propagation of Tropical fruit trees.
4. Oxford and IBN publishing Co., New Delhi. Guy W. Adriance and Feed R. Brison. Propagation of Horticultural Plants. Axis Books (India).
5. Hartman, H.T and Kester, D.E. 1976. Plant Propagation Principles and practices. Prentice hall of India Pvt.Ltd., Bombay.
6. Hudson T. Hartmann, Dale E. Kester, Fred T. Davies, Jr. and Robert L. Geneve. Plant Propagation- Principles and Practices (7th Edition). PHI Learning Private Limited, New Delhi-110001
7. Mukherjee, S.K. and Majumdar, P.K. 1973. Propagation of fruit crops. ICAR, New Delhi.
8. Bose TK & Som MG. (Eds.). 1986. Vegetable Crops in India. Naya Prokash.
9. Bose TK, Som G & Kabir J. (Eds.). 2002. Vegetable Crops. Naya Prokash.
10. Bose TK, Som MG & Kabir J. (Eds.). 1993. Vegetable Crops. Naya Prokash.
11. Bose TK, Kabir J, Maity TK, Parthasarathy VA & Som MG. 2003.
12. Vegetable Crops. Vols. I-III. Naya Udyog.
13. Chadha KL & Kalloo G. (Eds.). 1993-94. Advances in Horticulture Vols. V-X. Malhotra Publ. House. Chadha KL. (Ed.). 2002. Hand Book of Horticulture.
14. ICAR. Chauhan DVS. (Ed.). 1986. Vegetable Production in India.
15. Ram Prasad & Sons. Decoteau DR. 2000. Vegetable Crops. Prentice Hall.

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SEMESTER- V

Course Category-Vocational Skill Course (VSC)

Course Code-VSC-321-RE-AE-T

Paper Title: Applied Entomology-III

Theory (Credit 2) No. of Hours: 30 Hours

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Sr. No.	Topics	Lectures Assigned (L)
1	Introduction and scope of Applied Entomology	1
2	Industrial Entomology : - Introduction and scope in agro-based industries 2.1 Apiculture - Introduction - Classification and Biology of Honey Bees - Types of honey bees - Life cycle and caste system - Rearing of Bees: Bee Keeping Equipment - Bee Diseases and Enemies - Products of Apiculture Industry and its Uses 2.2 Lac Culture - Introduction - Biology and life cycle of lac insect - Host plants - Uses of lac	9

3	Important Agricultural Insect Pests: General Morphology, Nature of Damage and Control Measures : 3.1 Crop Pests: • Maize stem borer (<i>Chilo partellus</i>) • Sugarcane shoot borer (<i>Chilo infuscatellus</i>) • Red cotton bug (<i>Dysdercus cingulatus</i>) 3.2 Vegetable Pests: • Brinjal fruit borer (<i>Leucinodes orbonalis</i>) • Tomato fruit borer (<i>Helicoverpa armigera</i>) 3.3 Stored Grain Pests: • Rice weevil (<i>Sitophilus oryzae</i>) • Red flour beetle (<i>Tribolium castaneum</i>) • Pulse beetle (<i>Callosobruchus chinensis</i>) 3.4 Fruit Pests: • Mango stem borer (<i>Batocera rufomaculata</i>) • Pomegranate fruit borer (<i>Deudorix isocrates</i>)	10
4	Plant Protection Appliances : Types and Applications 4.1 Sprayers: Hand Sprayer, Knapsack Sprayer, Power Sprayer 4.2 Dusters: Rotary duster, Power duster 4.3 Drone-based Spraying (Agricultural Drones)	3
5	Insecticide Formulation, Labelling & Code Type : • Basic Principles • Solid, Liquid, Gaseous formulations • Colour code (toxicity classification)	2
6	Integrated Pest Management (IPM) : • Concept and principles of IPM	1
7	Entomophagy and Insects as Food & Feed: 7.1 Introduction to Entomophagy • Definition and concept of entomophagy 7.2 Insect Meal • Concept of insect-based feed (insect meal) • Nutritional value of insects (protein, fats, vitamins, minerals) • Common insects used: ▪ Mealworms (<i>Tenebrio molitor</i>) ▪ Black soldier fly (<i>Hermetia illucens</i>) ▪ Crickets (<i>Acheta domesticus</i>) • Use in as animal feed 7.3 Global trends in edible insect industry	4

Savitribai Phule Pune University, Pune
T.Y.B.Sc. Restructuring Pattern Syllabus (as per NEP-2020)
Syllabus from June 2026

SEMESTER- V
Course Category-Vocational Skill Course (VSC)
Course Code-VSC-321-RE-DS-T
Paper Title: Dairy Science-III
Theory (Credit 2) No. of Hours: 30 Hours

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Objectives:

- 1) To give applied Knowledge to the students
- 2) Understand the fundamentals of Dairy Science
- 3) Learn about different types Milk Products
- 4) Study Dairy Science practices and techniques
- 5) Explore the importance of Dairy Science in human life

Course Outcomes:

- CO 1: To Remembering Common Definition used in Dairy Science.
 CO 2: To Classify and Understanding Dairy products.
 CO 3: To Identify Composition of Milk.
 CO 4: To study Importance and economics of Dairy plant.
 CO5: To remembering Objectives of Pasteurization.
 CO6: To Identify platform test.

Sr. No.	Topic Details	No. of Lectures
	Credit-I	15L
1	Chapter-1: Composition of Milk a)Definition of milk b) Composition of milk of different animal species (Cow, Buffalo, Human, Sheep, Goatetc. c) Physico-chemical properties of milk.	2
2	Chapter-2: Dairy Plant Design and Layout a) Definition of Dairy Science b) Present position of Livestock in India and World (Indian Dairy Scenario). c) Special Characteristics of Dairy Industry d) Importance and economics of plant design e)Legal and commercial aspects of plant design	3
3	Chapter-3: Pasteurization of milk a)Definition b) History c) Objectives d) Methods of pasteurization.	2

4	Chapter-4:Homogenization of Milk a)Definition b) Merits and Demerits c)Factors influencing on homogenization	2
5	Chapter-5:Cooling and Transportation of Milk a) Milk Reception b) Various mode of transportation of milk to Dairy industry c) The important equipment's for reception of milk processing plant: Can conveyor, Milk weighing tank, milk chiller, Can washer, Milk pump etc. d) Chilling Centers in dairy plant: Types of milk cooling systems e)Importance Cooling and Transportation of Milk	3
6	Chapter-6:Quality and Safety monitoring in Dairy Industry a)Current awareness on quality and safety of dairy foods; consumer awareness and their demands for safe foods b) International standards; quality (ISO 9001:2000) and food safety (HACCP) system and their application during milk production and processing. C) National and international food regulatory standards; BIS, PFA, ICMSF, IDF etc.	3
	Credit-II	15L
7	Chapter-7:Platform Tests a) Milk tanker b) Milk Can c) Smell (Odour) d) Appearance e)Temperature	3
8	Chapter-8: Dairy Plant Management & Pollution Control a) Cleaning and sanitation of dairy equipment: Types of cleaning and sanitizing agents and mode of action. b) Different types of cleaning methods:(i) Hand washing, (ii) Mechanical washing. c) Dairy waste water management, Environmental hygiene in dairy plant and personnel hygiene.	3
9	Chapter-9:Indian Dairy products a) Introduction to Kheer, Khoa/Mawa, Pedha, Khurchan, Rabri, Dahi, Shrikhand, Ghee etc. b) Flow diagram of Manufacture from whole milk.	3
10	Chapter-10:Dairy by-Products a)Definition b)Introduction c)Classification (Skim milk, Butter milk and Whey) d)Composition	3

11	Chapter-11:Frozen milk products a) Introduction to Indian frozen dairy products. b)Ice-cream-Definition, Composition, Method of Manufacturing, Packaging. c) Softy Ice-cream-Definition, Composition Method of manufacturing. d) Kulfi- Definition, Method of Manufacturing.	3
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References:

1. Animal Husbandry - by G.C. Banarjee
2. Animal Nutrition - by G.C. Banarjee
3. Handbook of Dairy Science - by I.C.A.R.
4. Handbook of Agriculture - by I.C.A.R.
5. Text book of Animal Science Technology - H.S.C. Board
6. Milk and milk products – Winton and Winton (1993) Agrobios (India), Agro. House behind Nasrani cinema. Chopsani road Jodhapur.
7. Milk Testing – Davis.J.G. Agribios (India) Agro house behind Nasrani cinema Chopsani road Jodhapur.
8. Chemistry of milk and milk products. Singh V.B. (1965) Asian publishers. New mandi. Muzaffaranagar.
9. Dairy Science: Petersen (W.E.) Publisher – Lippincott & Company
10. Outlines of Dairy Technology – Sukumar (De) – Oxford University press
11. Indian Dairy Products – Rangappa (K.S.) & Acharya (KT) – Asia Publishing House.
12. Economics of Milk Production – Bharati Pratima Acharya Publishers.

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Course Category: Field Project (FP)

SEMESTER	COURSE CODE	TITLE OF THE SUBJECT
V	FP-331-RE-PC	Pharmaceutical Chemistry- Project
V	FP-332-RE-ES	Energy Studies- Project
V	FP-333-RE-HM	Horticulture and Its Management- Project
V	FP-334-RE-AE	Applied Entomology- Project
V	FP-335-RE-DS	Dairy Science- Project

T. Y. B. Sc. RESTRUCTURING PATTERN

Course Category: Field Project (FP) [Semester - V]

Course Code – FP-331-RE-PC (Pharmaceutical Chemistry- Project)

[No. of Credits: 2 C]

[No. of Lectures: 60 L]

Guidelines for Field Projects in Pharmaceutical Chemistry

Introduction

A field project in Pharmaceutical Chemistry provides students with practical exposure to pharmaceutical industries, research laboratories, quality control units, and drug manufacturing processes. This course helps students apply theoretical knowledge to real-world pharmaceutical practices, develop analytical and problem-solving skills, and gain insights into current trends and regulations in the pharmaceutical sector. Through field visits, data collection, and project-based learning, students enhance their professional competence and preparedness for careers in pharmaceutical research, development, and industry.

Course Objectives of Field Project

1. To provide practical exposure to pharmaceutical chemistry concepts and industrial applications.
2. To understand the processes involved in drug discovery, development, manufacturing, and quality control.
3. To develop skills in the use of analytical and laboratory techniques employed in the pharmaceutical industry.
4. To enhance problem-solving, data collection, analysis, and scientific reporting abilities.
5. To encourage the application of theoretical knowledge to real-world pharmaceutical challenges.
6. To promote awareness of current advancements, research trends, and innovations in pharmaceutical chemistry.

Course Outcomes

After completion of the field project, students will be able to:

1. Explain the practical applications of pharmaceutical chemistry in drug development, manufacturing, and quality control.
2. Apply analytical and problem-solving skills to investigate and address pharmaceutical chemistry-related challenges.
3. Collect, organize, analyze, and interpret scientific data obtained during field visits and project activities.
4. Prepare technical reports and present project findings effectively using scientific and professional communication skills.
5. Evaluate the role of quality assurance, quality control, and regulatory compliance in ensuring the safety and efficacy of pharmaceutical products.
6. Develop awareness of current trends, innovations, and career opportunities in pharmaceutical chemistry and related industries.

Areas for Field Projects

Students may conduct projects in the following areas:

1. Storage and handling of medicines
2. Disposal practices for expired and unused medicines
3. Environmental impact of pharmaceutical waste
4. Survey of antibiotic use
5. Study of self-medication practices in the community
6. Safety measures in pharmaceutical industries
7. Types of pharmaceutical packaging materials
8. Labeling requirements and regulatory standards
9. Market survey of commonly prescribed medicines
10. Brand comparison and pricing analysis

Guidelines for Conducting Field Project in Pharmaceutical Chemistry

1. Selection of Topic
 - Select a relevant and feasible topic related to pharmaceutical chemistry, pharmaceutical industries, quality control, regulatory affairs, hospital pharmacy, or pharmaceutical marketing.
 - Ensure that the topic has practical significance and scope for data collection.
2. Project Planning
 - Define the project title, objectives, methodology, and expected outcomes.
 - Prepare a work plan and timeline for completing the project.
 - Obtain approval from the project supervisor/guide before starting the work.
3. Field Visit and Data Collection
 - Conduct visits to pharmaceutical industries, quality control laboratories, research centers, hospitals, community pharmacies, or related organizations.
 - Collect information through observations, interviews, questionnaires, records, and literature sources.
 - Maintain a field Dairy or logbook to record observations and activities.
4. Ethical and Professional Conduct
 - Seek permission from the concerned organization before collecting data.
 - Maintain confidentiality of any sensitive information obtained during the study.
 - Follow institutional, industrial, and laboratory safety regulations.
 - Demonstrate professional behavior during field visits and interactions.
5. Data Analysis and Interpretation
 - Organize and analyze the collected data using appropriate scientific methods.
 - Present findings using tables, graphs, charts, and figures wherever applicable.

- Interpret results based on scientific principles and relevant literature.

6. Report Preparation

The final project report should contain:

1. Title page
2. Certificate
3. Acknowledgement
4. Introduction
5. Objectives
6. Materials and Methods
7. Observations and Results
8. Discussion
9. Conclusion
10. Suggestions/Recommendations
11. References

Evaluation Criteria

Criteria	Marks (%)
Topic Selection and Planning	10
Field Work and Practical Skills	30
Data Collection and Analysis	20
Project Report	25
Presentation/Viva	15

Student Responsibilities for Field Project in Pharmaceutical Chemistry

1. Complete project and maintain punctuality.
2. Follow discipline, safety rules, and professional ethics at the workplace or field site.
3. Wear proper laboratory coat, gloves, masks, or safety equipment whenever required.
4. Maintain a daily work Dairy/logbook of all activities and observations.
5. Perform assigned tasks sincerely under the guidance of supervisors.
6. Handle laboratory instruments, seeds, chemicals, and equipment carefully.
7. Collect and record field and laboratory data accurately.
8. Maintain cleanliness and hygiene in laboratories, seed processing units, and field areas.
9. Respect the rules, regulations, and confidentiality of the organization or institution.
10. Communicate effectively with supervisors, staff members, farmers, and team members.
11. Participate actively in field visits, demonstrations, surveys, and practical activities.
12. Submit reports, assignments, and project work within the specified time.
13. Analyze observations and prepare conclusions scientifically.
14. Avoid misuse or wastage of chemicals, laboratory materials, and resources.
15. Report any problems, accidents, or equipment damage immediately to the supervisor.
16. Develop teamwork, leadership, and problem-solving skills during the project/training period.
17. Prepare and deliver presentations or viva reports confidently at the end of the project/training.
18. Maintain positive behavior and represent the institution professionally during training/project activities.

T. Y. B. Sc. RESTRUCTURING PATTERN**Course Category: Field Project (FP) [Semester - V]****Course Code – FP-332-RE-ES (Energy Studies - Project)****[No. of Credits: 2 C]****[No. of Lectures: 60 L]****Guidelines for Field Projects in Energy Studies****Introduction**

Energy Studies provides students with basic knowledge of renewable and conventional energy sources, energy conversion systems, energy storage, and conservation techniques. The course focuses on solar, biomass, and wind energy technologies, along with emerging energy resources, to promote understanding of sustainable energy solutions and efficient energy utilization.

Course Objectives of Field Project

1. To develop practical skills in the operation and assessment of renewable energy systems.
2. To understand the working principles of solar, wind, and biomass energy technologies.
3. To gain hands-on experience in energy measurement, monitoring, and performance evaluation.
4. To improve observation, data collection, analysis, and interpretation skills related to energy systems.
5. To encourage problem-solving and research-based learning in the field of sustainable energy.
6. To familiarize students with modern energy conservation techniques and energy auditing practices.
7. To promote teamwork, technical communication, and report-writing skills through field-based energy studies.

Course Outcomes

After completion of the field project, students will be able to:

1. Apply energy studies concepts to analyse real-world energy systems and applications.
2. Conduct performance assessment and efficiency evaluation of renewable energy devices.
3. Understand the operation and management of solar, wind, biomass, and energy storage systems.
4. Analyze energy-related problems and propose suitable energy conservation measures.
5. Prepare technical reports and presentations based on field observations and collected data.
6. Develop confidence for careers in renewable energy, energy management, research, and related industries.

Areas for Field Projects

Students may conduct projects in the following areas:

1. Study of solar cookers and their efficiency.
2. Performance analysis of solar water heaters.
3. Survey of rooftop solar panel installations.

4. Measurement of solar radiation and ambient temperature.
5. Energy consumption audit of homes or college buildings.
6. Study of energy-saving electrical appliances.
7. Comparative study of conventional and renewable energy sources.
8. Study of biogas plants and their applications.
9. Wind speed measurement and basic wind energy assessment.
10. Analysis of electricity consumption patterns in households.

Guidelines for Conducting Field Project

1. Selection of Topic

- Select a relevant and practical topic related to Energy Studies.
- The project should focus on energy generation, conservation, or renewable energy applications.

2. Project Planning

- Define the objectives of the study clearly.
- Prepare a work plan and methodology.
- Identify the required instruments, materials, and study area.

3. Field Work

- Visit solar installations, biogas plants, wind energy sites, industries, institutions, or residential areas as required.
- Record observations systematically.
- Follow safety guidelines during field visits and measurements.

4. Data Collection

- Collect accurate data related to energy consumption, generation, or system performance.
- Use tables, graphs, charts, and photographs wherever necessary.

5. Analysis and Interpretation

- Analyze the collected data scientifically.
- Compare results with standard values, specifications, or published studies.

6. Report Preparation

The final project report should contain:

12. Title page
13. Certificate
14. Acknowledgement
15. Introduction
16. Objectives
17. Materials and Methods
18. Observations and Results
19. Discussion
20. Conclusion
21. Suggestions/Recommendations
22. References
23. Photographs/Appendices

Suggested Field Project Topics

Sr. No.	Project Topic
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Sr. No.	Project Topic
1	Study of solar cooker performance under different weather conditions
2	Survey of solar panel installations in the local area
3	Comparative study of LED and conventional lighting systems
4	Household electricity consumption analysis
5	Study of energy-saving practices in homes and educational institutions
6	Performance analysis of solar water heaters
7	Survey of renewable energy awareness among the public
8	Study of biogas plants and their applications
9	Measurement and analysis of local wind speed data
10	Energy audit of a classroom, laboratory, or college building
11	Comparative study of renewable and non-renewable energy sources
12	Study of battery storage systems used in solar applications
13	Assessment of electricity usage patterns in rural and urban households
14	Study of solar-powered street lights in the local area

Evaluation Criteria

Criteria	Marks (%)
Topic Selection and Planning	10
Field Work and Practical Skills	30
Data Collection and Analysis	20
Project Report	25
Presentation/Viva	15

Student Responsibilities for Field Project in Energy Studies

1. Complete the project work regularly and maintain punctuality.
2. Follow discipline, safety rules, and professional ethics during field visits and project activities.
3. Use measuring instruments, electrical devices, and laboratory equipment carefully.
4. Maintain a daily work Dairy/logbook of activities, observations, and data collected.
5. Perform assigned tasks sincerely under the guidance of the project supervisor.
6. Collect and record field data accurately and systematically.
7. Follow proper procedures during surveys, energy audits, and performance evaluations.
8. Maintain cleanliness and safety at the workplace, laboratory, and field sites.
9. Respect the rules and regulations of the organization, institution, or industry visited.
10. Communicate effectively with supervisors, staff members, and team members.
11. Participate actively in field visits, surveys, demonstrations, and practical activities.
12. Submit project reports, assignments, and records within the specified time.
13. Analyse observations and interpret results scientifically.
14. Avoid misuse or wastage of energy, materials, and laboratory resources.
15. Report any problems, accidents, or equipment damage immediately to the supervisor.
16. Develop teamwork, leadership, and problem-solving skills during the project.
17. Prepare and deliver project presentations or viva reports confidently.
18. Follow environmentally responsible practices and promote energy conservation.
19. Maintain honesty and integrity in data collection and reporting.
20. Represent the institution professionally during all project and field activities.

T. Y. B. Sc. RESTRUCTURING PATTERN**Course Category – Field Project (FP) [Semester - V]****Course Code – FP-333-RE-HM (Horticulture and Its Management- Project)****[No. of Credits: 2 C]****[No. of Lectures: 60 L]****Guidelines for Field Projects in Horticulture and its Management****Introduction**

Field projects in Horticulture and its Management are designed to provide students with practical knowledge and hands-on experience in Nursery Management, production of sapling, study of soil climate for commercial production of horticultural crops. These projects help students apply theoretical concepts to real agricultural and industrial processing of fruits.

Course Objectives of Field Project

1. To develop practical skills in Horticulture and its Management operations.
2. To understand field-level Hybrid variety production practices.
3. To gain experience in fruit crop quality assessment.
4. To improve observation, data collection, and analytical skills.
5. To encourage problem-solving and research-based learning.
6. To familiarize students with modern technologies used in the processing industry.
7. To promote teamwork, communication, and report-writing skills.

Course Outcomes

After completion of the field project, students will be able to:

1. Apply Horticulture and its Management concepts in real field conditions.
2. Conduct fruit testing and quality evaluation independently.
3. Understand industrial and agricultural fruit crop practices.
4. Analyze field problems and suggest suitable solutions.
5. Prepare technical reports and presentations effectively.
6. Develop confidence for careers in seed industries, research and agriculture sectors.

Areas for Field Projects

Students may conduct projects in the following areas:

1. Good quality saplings for plantation.
2. Orchard Management
4. Fruit Storage
5. Export quality fruit production
6. Export fruit Marketing and Entrepreneurship
7. Biotechnological Applications
8. Organic Farming
10. Biological Control

Guidelines for Conducting Field Project**1. Selection of Topic**

- Select a relevant and practical topic related to Horticulture and its Management.
 - The project should address real agricultural or industrial problems.

2. Project Planning

- Define objectives clearly.
- Prepare work schedule and methodology.
- Identify required materials, equipment, and study area.

3. Field Work

- Visit farms, seed industries, laboratories, or research centers regularly.
- Record observations systematically.
- Follow safety and ethical practices during field activities.

4. Data Collection

- Collect accurate field and laboratory data.
- Use tables, charts, and photographs wherever necessary.

5. Analysis and Interpretation

- Analyze collected data scientifically.
- Compare results with standard recommendations or previous studies.

6. Report Preparation

The final project report should contain:

1. Title page
2. Certificate
3. Acknowledgement
4. Introduction
5. Objectives
6. Materials and Methods
7. Observations and Results
8. Discussion
9. Conclusion
10. Suggestions/Recommendations
11. References
12. Photographs/Appendices

Suggested Field Project Topics

Sr. No.	Project Topic
1	Study of different propagation methods in different fruit crops
2	Effect of climatic conditions on fruit setting on various region
3	Comparative study of fruit crop production methods
4	Propagation methods in good quality fruit crop production techniques
5	Good quality assessment of locally available local varieties
6	Study of diseases in Fruit crop plants
7	Soil content analysis during plantation of orchards
8	Survey of fruit marketing systems in local areas
9	Performance evaluation of improved fruit varieties
10	Organic farming practices
11	Role of biofertilizers in fruit crop

Sr. No.	Project Topic
12	Comparative study of manual and mechanical fruit grading
13	Farmer awareness regarding certified improved varieties
14	Study of post-harvest seed processing methods

Evaluation Criteria

Criteria	Marks (%)
Topic Selection and Planning	10
Field Work and Practical Skills	30
Data Collection and Analysis	20
Project Report	25
Presentation/Viva	15

Student Responsibilities for Field Project in Horticulture and its Management

1. Complete project and maintain punctuality.
2. Follow discipline, safety rules, and professional ethics at the workplace or field site.
3. Wear proper laboratory coat, gloves, masks, or safety equipment whenever required.
4. Maintain a daily work Dairy/logbook of all activities and observations.
5. Perform assigned tasks sincerely under the guidance of supervisors.
6. Handle laboratory instruments, seeds, chemicals, and equipment carefully.
7. Collect and record field and laboratory data accurately.
8. Follow proper procedures during fruit crop production, processing, testing, and storage activities.
9. Maintain cleanliness and hygiene in laboratories, seed processing units, and field areas.
10. Respect the rules, regulations, and confidentiality of the organization or institution.
11. Communicate effectively with supervisors, staff members, farmers, and team members.
12. Participate actively in field visits, demonstrations, surveys, and practical activities.
13. Submit reports, assignments, and project work within the specified time.
14. Analyze observations and prepare conclusions scientifically.
15. Avoid misuse or wastage of seeds, chemicals, laboratory materials, and resources.
16. Report any problems, accidents, or equipment damage immediately to the supervisor.
17. Develop teamwork, leadership, and problem-solving skills during the project/training period.
18. Prepare and deliver presentations or viva reports confidently at the end of the project/training.
19. Follow ethical agricultural and environmental practices during field work.
20. Maintain positive behavior and represent the institution professionally during training/project activities.

T. Y. B. Sc. RESTRUCTURING PATTERN**Course Category – Field Project (FP) [Semester - V]****Course Code – FP-334-RE-AE (Applied Entomology - Project)****[No. of Credits: 2 C]****[No. of Lectures: 60 L]**

Guidelines for Field Projects in Applied Entomology**Introduction**

Field projects in Applied Entomology are designed to provide students with practical knowledge and hands-on experience in insect identification, pest monitoring, integrated pest management (IPM), biological control, apiculture, sericulture, and insect biodiversity studies. These projects enable students to apply theoretical concepts learned in the classroom to real agricultural, horticultural, and environmental situations. Through field visits, surveys, laboratory work, and interactions with farmers and agricultural experts, students gain valuable experience in insect pest management, beneficial insect conservation, and sustainable crop protection practices. The field projects also help students develop scientific observation, data collection, analytical, and problem-solving skills required for careers in agriculture, research, extension services, and allied industries.

Course Objectives of Field Project

1. To develop practical skills in insect collection, identification, and preservation.
2. To understand insect pest monitoring and Integrated Pest Management (IPM).
3. To gain experience in the study of insect pests and beneficial insects.
4. To improve observation, data collection, and analytical skills.
5. To encourage problem-solving and research-based learning.
6. To familiarize students with modern techniques in pest management and biological control.
7. To promote teamwork, communication, and scientific report-writing skills.

Course Outcomes

1. After completion of the field project, students will be able to:
2. Apply Applied Entomology concepts in field conditions.
3. Identify and assess insect pests and beneficial insects.
4. Understand pest management and biological control practices.
5. Analyze field problems and suggest suitable solutions.

6. Prepare scientific reports and presentations effectively.
7. Develop skills for careers in agriculture, research, and pest management sectors.

Areas for Field Projects

Students may conduct projects in the following areas:

1. Insect Pest Survey and Monitoring
2. Integrated Pest Management (IPM)
3. Biological Control of Agricultural Pests
4. Apiculture (Beekeeping) and Pollination
5. Sericulture and Silkworm Rearing
6. Insect Biodiversity and Conservation
7. Mass Rearing of Beneficial Insects
8. Organic and Eco-friendly Pest Management
9. Storage Pest Management
10. Biotechnological Applications in Entomology
11. Medical and Veterinary Entomology
12. Insect Ecology and Environmental Studies

Guidelines for Conducting Field Project

1. Selection of Topic

- Select a relevant and practical topic related to Applied Entomology.
- The project should address real agricultural, environmental, or pest management problems.

2. Project Planning

- Define objectives clearly.
- Prepare a work schedule and methodology.
- Identify required materials, equipment, and study area.

3. Field Work

- Visit farms, apiaries, sericulture units, laboratories, or research centers regularly.
- Record observations systematically.
- Follow safety and ethical practices during field activities.

4. Data Collection

- Collect accurate field and laboratory data.
- Use tables, charts, photographs, and insect specimens wherever necessary.

5. Analysis and Interpretation

- Analyze collected data scientifically.
- Compare results with standard recommendations or previous studies.

6. Report Preparation

The final project report should contain:

1. Title Page
2. Certificate
3. Acknowledgement
4. Introduction
5. Objectives
6. Materials and Methods
7. Observations and Results
8. Discussion
9. Conclusion
10. Suggestions/Recommendations
11. References
12. Photographs/Appendices

Suggested Field Project Topics

Sr. No.	Project Topic
1	Survey and identification of insect pests in agricultural crops
2	Effect of climatic factors on insect pest abundance and distribution
3	Comparative study of pest management practices in different crops
4	Study of Integrated Pest Management (IPM) techniques
5	Diversity and abundance of beneficial insects in agricultural fields
6	Study of insect pests and diseases associated with crop plants
7	Survey of storage pests in grains and their management
8	Assessment of insect biodiversity in local ecosystems
9	Performance evaluation of biological control agents against crop pests
10	Organic pest management practices adopted by farmers
11	Role of pollinators in crop production
12	Comparative study of chemical and biological pest control methods

13	Farmer awareness regarding Integrated Pest Management (IPM)
14	Study of mass rearing techniques of beneficial insects

Evaluation Criteria

Criteria	Marks (%)
Topic Selection and Planning	10
Field Work and Practical Skills	30
Data Collection and Analysis	20
Project Report	25
Presentation/Viva	15

Student Responsibilities for Field Project in Horticulture and its Management

1. Complete the project work regularly and maintain punctuality.
2. Follow safety rules, discipline, and professional ethics.
3. Use appropriate protective equipment during field and laboratory work.
4. Maintain a daily record of activities and observations.
5. Collect and record data accurately.
6. Handle insect specimens, chemicals, and equipment carefully.
7. Participate actively in field visits, surveys, and practical activities.
8. Maintain cleanliness in laboratories and field sites.
9. Submit reports and assignments on time.
10. Communicate effectively with supervisors and team members.
11. Analyze observations and prepare scientific conclusions.
12. Develop teamwork, leadership, and problem-solving skills.
13. Follow environmentally sustainable practices.
14. Prepare and present project findings confidently.
15. Represent the institution professionally during project activities.

T. Y. B. Sc. RESTRUCTURING PATTERN

Course Category – Field Project (FP) [Semester - V]

Course Code – FP-335-RE-DS (Dairy Science- Project)

[No. of Credits: 2 C]

[No. of Lectures: 60 L]

Guidelines for Field Projects in Dairy Science- Project

Introduction

Field projects in Dairy Science are designed to provide students with practical knowledge and hands-on experience in Milk and milk products, Dairy cattle management, Fodder production, commercial production of Heat Coagulated, fermented, Concentrated, Frozen milk products. These projects help students apply theoretical concepts to real agricultural and industrial processing of fruits.

Course Objectives of Field Project

1. To develop practical skills in Dairy Science operations.
2. To understand field-level Milk production practices.
3. To gain experience in milk quality assessment.
4. To improve observation, data collection, and analytical skills.
5. To encourage problem-solving and research-based learning.
6. To familiarize students with modern technologies used in the Dairy milk processing industry.
7. To promote teamwork, communication, and report-writing skills.

Course Outcomes

After completion of the field project, students will be able to:

1. Apply Dairy Science concepts in real field conditions.
2. Conduct Milk testing and quality evaluation independently.
3. Understand industrial and Traditional milk product preparation practices.
4. Analyze field problems and suggest suitable solutions.
5. Prepare technical reports and presentations effectively.
6. Develop confidence for careers in dairy industries, research and Dairy farm sectors.

Areas for Field Projects

Students may conduct projects in the following areas:

1. Good quality milk producing cattle herd.
2. Cattle house Management
4. Milk Collection and Storage
5. Export quality milk production
6. Export milk product Marketing and Entrepreneurship
7. Industrial Applications

Guidelines for Conducting Field Project

1. Selection of Topic

- Select a relevant and practical topic related to Dairy Science.
- The project should address real traditional or industrial milk product production problems.

2. Project Planning

- Define objectives clearly.
- Prepare work schedule and methodology.
- Identify required materials, equipment, and study area.

3. Field Work

- Visit cattle/Dairy farms, dairy/milk industries, laboratories, or research centers regularly.
- Record observations systematically.
- Follow safety and ethical practices during dairy farm activities.

4. Data Collection

- Collect accurate dairy farm and laboratory data.
- Use tables, charts, and photographs wherever necessary.

5. Analysis and Interpretation

- Analyze collected data scientifically.
- Compare results with standard recommendations or previous studies.

6. Report Preparation

The final project report should contain:

1. Title page
2. Certificate
3. Acknowledgement
4. Introduction
5. Objectives
6. Materials and Methods
7. Observations and Results
8. Discussion
9. Conclusion
10. Suggestions/Recommendations
11. References
12. Photographs/Appendices

Suggested Field Project Topics

Sr. No.	Project Topic
1	Study of different fodder cultivation techniques
2	Effect of climatic conditions on milk production
3	Comparative study of milk production in different breeds of cow
4	Scientific Survey of milk producing farmers nearby area.
5	Milk quality assessment of locally available milk .
6	Study of diseases in Cow
7	Comparative Study of Cattle housing management
8	Survey of milk/milk products marketing systems in local areas
9	Study of feeds and fodder management in cattle
10	Silage/hay making practices
11	Study of traditional method of preparation of different milk products
12	Comparative study of manual and machine milking
13	Farmer awareness regarding improved Cow /Goat/ Buffalo breeds
14	Study of milk processing methods

Evaluation Criteria

Criteria	Marks (%)
Topic Selection and Planning	10
Field Work and Practical Skills	30
Data Collection and Analysis	20
Project Report	25
Presentation/Viva	15

Student Responsibilities for Field Project in Dairy Science

1. Complete project and maintain punctuality.
2. Follow discipline, safety rules, and professional ethics at the workplace or field site.
3. Wear proper laboratory coat, gloves, masks, or safety equipment whenever required.
4. Maintain a daily work Dairy/logbook of all activities and observations.
5. Perform assigned tasks sincerely under the guidance of supervisors.
6. Handle laboratory instruments, milk sample, chemicals, and equipment carefully.
7. Collect and record field and laboratory data accurately.
8. Follow proper procedures during milk sampling, production, processing, testing, and storage activities.
9. Maintain cleanliness and hygiene in laboratories, milk processing units, and Dairy farm areas.
10. Respect the rules, regulations, and confidentiality of the organization or institution.
11. Communicate effectively with supervisors, staff members, farmers, and team members.
12. Participate actively in field visits, demonstrations, surveys, and practical activities.
13. Submit reports, assignments, and project work within the specified time.
14. Analyze observations and prepare conclusions scientifically.
15. Avoid misuse or wastage of milk samples, chemicals, laboratory materials, and resources.
16. Report any problems, accidents, or equipment damage immediately to the supervisor.
17. Develop teamwork, leadership, and problem-solving skills during the project/training period.
18. Prepare and deliver presentations or viva reports confidently at the end of the project/training.
19. Follow ethical agricultural and environmental practices during field work.
20. Maintain positive behavior and represent the institution professionally during training/project activities.

T. Y. B. Sc. RESTRUCTURING PATTERN**Course Category – Field Project (FP) [Semester - V]****Course Code – FP-335-RE-DS (Dairy Science- Project)****[No. of Credits: 2 C]****[No. of Lectures: 60 L]**

Guidelines for Community Engagement Program in the Field of Dairy Science

Introduction

Community Engagement Programs in Dairy Science are organized to connect educational institutions, students, farmers, Dairy industries and rural communities for the promotion of quality milk production, awareness, and sustainable dairy practices. These programs help students gain practical exposure while contributing to community development.

Objectives of Community Engagement Program

- To create awareness among farmers about quality milk and modern technologies.
- To promote the use of high-quality breeds for better milk production.
- To provide practical exposure to students through community interaction and dairy farm activities.
- To transfer scientific knowledge and improved dairy practices to rural communities.
- To encourage sustainable dairy and milk conservation practices.
- To develop communication, leadership and teamwork skills among students.
- To strengthen collaboration between educational institutions, farmers, and Dairy industries.

Course Outcomes

After completion of the Community Engagement Program, students will be able to:

- Communicate scientific Dairy Science concepts effectively to farmers and communities.
- Understand real Dairy farm problems related to milk production and quality.
- Apply practical knowledge in field situations.
- Develop leadership, teamwork, and social responsibility.
- Promote awareness about quality milk and sustainable Dairy farm/agricultural practices.
- Contribute to rural development and Dairy animal milk productivity improvement.

Major Areas of Community Engagement

1. Farmer Awareness Programs

- Importance of milk
- Improved Cow breeds
- Government schemes related to milk producer farmers
- Dairy farm establishment techniques.
- Dairy farm Layout methods
- Milking methods and techniques
- Good Quality milk and Testing Awareness
- Milk processing and storage techniques
- Identification of healthy and diseased milk
- Cleaning and sterilization of dairy utensils Practices

2. Training and Workshops

- Hands-on training for farmers and self-help groups
- Demonstration of milk processing equipment

- Entrepreneurship opportunities in Dairy business

3. Surveys and Data Collection

- Milk producer Farmer survey
- Comparative milk production survey of local and Exotic cow breeds
- Problems faced by farmers in good quality milk production techniques.

Guidelines for Conducting the Program

1. Planning and Preparation

- Identify community needs and target groups.
- Select suitable topics related to Dairy Science.
- Prepare training materials, charts, posters, and demonstrations.
- Coordinate with local Veterinary officers, Dairy research institutes, Dairy milk industries, or farmer groups.

2. Selection of Location

Programs may be conducted at:

- Villages and rural communities
- Farmer training centers
- Agricultural schools and colleges
- Dairy farms and demonstration plots

Role of Students

- Participate actively in awareness campaigns and farm demonstrations.
- Interact respectfully with farmers and community members.
- Conduct surveys and collect dairy farm information accurately.
- Assist in demonstrations of milk testing methods.
- Prepare educational materials and presentations.
- Maintain records, photographs, and reports of activities.
- Promote scientific and environmentally friendly farming practices.

Role of Faculty/Program Coordinator

- Guide students during planning and execution of activities.
- Arrange expert lectures and technical support.
- Coordinate with government departments and local organizations.
- Monitor student participation and program effectiveness.
- Evaluate reports and provide feedback.

Suggested Community Engagement Activities

Sr. No.	Activity
1	Awareness campaign on hygiene in milk production
2	Demonstration of milk testing
3	Farmer training on milking methods
4	Milk Processing and storage management awareness program
5	Village survey on milk usage practices
6	Demonstration of milk products preparation
7	Milk production awareness

Sr. No.	Activity
8	Exhibition on improved cow breeds
9	Distribution of educational pamphlets/posters
10	Workshop on entrepreneurship in Dairy business
11	Awareness on milk-borne diseases and control
12	Demonstration of cleaning and sterilization of dairy utensils.
13	Community local Cow milk production awareness program
14	Farmer interaction with Dairy scientist and experts
15	Field visit to Dairy industry and Dairy cattle farms

Documentation and Report Preparation

The final report should include:

- Title of program
- Objectives
- Date and location
- Details of participants
- Activities conducted
- Photographs and survey data
- Observations and outcomes
- Problems identified in the community
- Suggestions and recommendations
- Conclusion

Evaluation Criteria

Criteria	Marks (%)
Participation and Discipline	20
Communication and Teamwork	20
Field Activities and Practical Work	30
Report Preparation	20
Presentation/Viva	10

Organizations that may support community engagement activities include:

- National Dairy Development Board
- National Dairy Corporation
- State Department of Animal husbandry
- Various milk processing industries
- Formation of Milk producer Farmers club
- Communication with progressive farmers
- Attend Agriculture Exhibition

Vocational Skill Courses (VSC) – (1P = 2C) (Any one from basket)			
T.Y.B.Sc	VI	VSC-371-RE-PC-P	Pharmaceutical Chemistry-IV
	VI	VSC-372-RE-ES-P	Energy Studies-IV
	VI	VSC-373-RE-HM-P	Horticulture and Its Management –IV
	VI	VSC-374-RE-AE-P	Applied Entomology-IV
	VI	VSC-375-RE-DS-P	Dairy Science-IV
FP/OJT/CEP Community Engagement Program 4C (CEP) (Any one from basket)			
T.Y.B.Sc	VI	CEP-381-RE-PC	Pharmaceutical Chemistry -CEP
	VI	CEP-382-RE-ES	Energy Studies-CEP
	VI	CEP-383-RE-HM	Horticulture and Its Management-CEP
	VI	CEP-384-RE-AE	Applied Entomology-CEP
	VI	CEP-385-RE-DS	Dairy Science-CEP

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T.Y.B.Sc. Restructuring Pattern Syllabus (as per NEP-2020)
Syllabus from June 2026

SEMESTER- VI
Course Category-Vocational Skill Course (VSC)
Course Code-VSC-371-RE-PC-P
Paper Title: Pharmaceutical Chemistry Practical-IV
Theory (Credit 2) No. of Hours: 60 Hours

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Course Outcomes (COs)

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

CO 1: Laboratory Skills

Perform basic pharmaceutical chemistry experiments such as:

- Preparation of drugs
- Handling chemicals and laboratory apparatus safely

CO 2: Drug Identification

Identify pharmaceutical compounds using:

- Chemical tests
- Color reactions and confirmatory tests

CO 3: Instrumental Skills

Use basic instruments for pharmaceutical analysis:

- pH meter
- Flame photometer

CO 4: Pharmaceutical Formulation

- Prepare simple pharmaceutical dosage forms:
- Syrups, ointments, and basic formulations

CO5: Data Handling and Interpretation

- Record, analyze, and interpret experimental data:
- Observations, calculations, and results
- Error analysis and reporting

Syllabus

Perform any ten experiments

1. Estimation of Ibuprofen content from given pharmaceutical sample
2. Determination of Chloroquine phosphate content from given tablet
3. Determination of Calamine from given pharmaceutical sample
4. Estimation of Benzyl benzoate from given pharmaceutical sample

5. Determine the amount of Calcium from given pharmaceutical sample
 6. To determine the loss on drying of given pharmaceutical sample
 7. Determination of alkalinity of given pharmaceutical sample
 8. Determination of acidity of given pharmaceutical sample
 9. Estimation of Vitamin-C from pharmaceutical samples by volumetric methods
 10. Analysis of caffeine from given pharmaceutical sample.
 11. Estimation of sodium from formulation by flame photometry.
 12. Estimation of potassium from formulation by flame photometry.
 13. Preparation of capsule as per IP (any one).
 14. Preparation of tablet as per IP (any one).
 15. Pharmaceutical industrial visit and report writing (Compulsory).
-

Reference Books

1. Pharmacology and Pharmacotherapeutics by Satoskar and Bhandarkar, Popular Prakashan Bombay.
2. Pharmacology by R. D. Budhiraja, Popular Prakashan Bombay. Text book of Pharmaceutical Formulation by B. M. Mitthal, Vallabh Prakashan, Ahmedabad.
3. Pharmaceutics-I by R. M. Mehta, Vallabh Prakashan, Ahmedabad.
4. Foy's Medicinal Chemistry
5. An Introduction to Medicinal Chemistry – Garaham L. Pattrick, 5th Ed. Oxford.
6. Indian Pharmacopeia Vol. I & II. 2010.
7. Vogel's a Text Book of Practical Organic Chemistry by Vogel's, IIIrd edition.
8. Inorganic Pharmaceutical Chemistry by G.R. Chatwal, Himalaya Publication, Bombay
9. Pharmaceutical Chemistry by Jayashree Ghosh, S. Chand Publication, New Delhi

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Syllabus from June 2026

SEMESTER- VI

Course Category-Vocational Skill Course (VSC)

Course Code-VSC-371-RE-ES-P

Paper Title: Energy Studies Practical-IV

Theory (Credit 2) No. of Hours: 60 Hours

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Course Objectives

- CO1:** To Introduce Energy scenario in India along with the energy sources.
CO2: To studies all types of energy sources and their impact on Environment.
CO3: To study and aware various units of energy and their interconversions.
CO4: To aware the problems to be faced in Energy conversions.
CO5: To study Energy crisis and its solution.

Practical's:

(2 Credits)

Sr. No.	Name of Practical	No. of Practical
1.	Study of solar cell IV characteristics, fill factor and efficiency	1
2.	Spectral response of solar cell	1
3.	Efficiency of solar still	1
4.	Instantaneous thermal efficiency of parabolic collector	1
5.	Fresnel lens-Concentration ratio & Efficiency	1
6.	Temperature dependence of solar cell	1
7.	Instantaneous thermal efficiency of compound parabolic collector	1
8.	Instantaneous thermal efficiency of cylindrical parabolic collector	1
9.	Determination of wind power using Anemometer	1
10.	Wind Data Analysis	1
11.	Selectivity ratio of selective & non-selective coating Study of conversion of electrical energy into heat energy	1
12.	Study of conversion of chemical energy of fuel into electricity	1
13.	Measurement of consumption of electrical energy by kilo watt hour(kWh) meter	1
14.	Study of photovoltaic panel	1
15.	Direct conversion of radioisotope energy to electricity	1
16.	Field visit/study tour: Visit to: co-generation power plant/ Science center /Energy audit of laboratory/Energy survey of village/ photo thermal power station	2

- Note:** - 1. A student should complete at least any 15 practical's.
 2. In lieu of field visit, a student has to perform two practicals.

Reference Books:

1. Solar energy- By S.P. Agrawal
2. Non-conventional energy Resources- By B.H. Khan (The McGraw-Hill Co.)
3. Solar energy- By S.P. Sukhatme (Tata McGraw-HillCo.)
4. Solar energy Utilization- By G.D Rai (Khana Publishers)
5. Energy Resources 2nd Edition- By (McGraw-HillCo.)
6. Energy resources- By Andrew I Simon (Pergamon Press)

Savitribai Phule Pune University, Pune**T.Y.B.Sc. Restructuring Pattern Syllabus (as per NEP-2020)****Syllabus from June 2026****SEMESTER- VI****Course Category-Vocational Skill Course (VSC)****Course Code-VSC-371-RE-HM-P****Paper Title: Horticulture & its Management Practical-IV****Theory (Credit 2) No. of Hours: 60 Hours**

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Course Objectives:

1. Study horticultural practices and techniques
2. Learn about Commercial cultivation of fruit crops
3. Understand about fruit production technology
4. Study about Commercial vegetable cultivation

Course Outcomes:

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

CO1: They will understand Planning and designing gardens and lawn

CO2: Student will be understand commercial cultivation of fruit crops

CO3: They will understand the vegetable Crops fresh, raw, and processed products

CO4: Student will develop knowledge on industrial entrepreneurial skills related to Fruit and Vegetable.

Sr. No.	Practical Details	No. of Practical
1	To study Preparation of Media for propagation of plants in nursery beds and pot	1P
2	To study Preparation of nursery beds and sowing of seeds.	2P
3	To study Planning and designing gardens-Rockery, water and Terrace garden, and Japanese gardens	2P
4	To study preparation of land for lawn and planting	1P
5	Preparation of Jam/ Jelly	1P

6	Study of Planting Systems/Techniques for Commercial Fruit Crops Sapota/Guava/Banana/Pomegranate/Apple/Lemon/ Ber	1P
7	Study of Planting Techniques of Cluster bean /Cow pea /Dolichos	1P
8	Study of Planting Methods in Cole Crops-Cauliflower/Cabbage	1P
9	Preparation of Squash / Candies	1P
10	Preparation of chutneys/ sauces /pickles (hot and sweet)	1P
11	To perform the preparation of Vegetable Crops fresh products- Tomato Powder/ Onion Powder/Garlic Powder / Ginger Powder	2P
12	To perform the preparation of Vegetable Crops dried Onion - <i>Minced, Sliced, Toasted, Diced</i> /Garlic/Carrots	2P

Reference Books :

1. Chadha,K.L. (ICAR)2002,2001.Hand book of Horticulture. ICAR, New Delhi.
2. Chundawat,B.S. 1990.Arid fruit culture. Oxford and IBH, New Delhi
3. Ganner,R.J. and Choudhri,S.A.1972.Propagation of Tropical fruit trees.
4. Oxford and IBN publishing Co., New Delhi. Guy W. Adriance and Feed R. Brison. Propagation of Horticultural Plants. Axis Books (India).
5. Hartman,H.T and Kester,D.E.1976.Plant Propagation Principles and practices.Prentice hall of India Pvt.Ltd., Bombay.
6. Hudson T. Hartmann, Dale E. Kester, Fred T. Davies, Jr. and Robert L. Geneve. Plant Propagation- Principles and Practices(7th Edition). PHI Learning Private Limited, New Delhi-110001
7. Mukherjee,S.K. and Majumdar,P.K.1973.Propagation of fruit crops. ICAR, New Delhi.
8. Bose TK &Som MG. (Eds.). 1986. Vegetable Crops in India. NayaProkash.
9. Bose TK, Som G &Kabir J. (Eds.). 2002. Vegetable Crops. NayaProkash.
10. Bose TK, Som MG &Kabir J. (Eds.). 1993. Vegetable Crops. NayaProkash.
11. Bose TK, Kabir J, Maity TK, Parthasarathy VA &Som MG. 2003.
12. Vegetable Crops. Vols. I-III. NayaUdyog.
13. Chadha KL &Kalloo G. (Eds.). 1993-94. Advances in Horticulture Vols.V-X. Malhotra Publ. House. Chadha KL. (Ed.). 2002. Hand Book of Horticulture.
14. ICAR. Chauhan DVS. (Ed.). 1986. Vegetable Production in India.
15. Ram Prasad &Sons.Decoteau DR. 2000. Vegetable Crops.Prentice Hall.

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Syllabus from June 2026

SEMESTER- VI

Course Category-Vocational Skill Course (VSC)

Course Code-VSC-371-RE-AE-P

Paper Title: Applied Entomology Practical-IV

Theory (Credit 2) No. of Hours: 60 Hours

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Sr. No.	Title of Practical	No of Practical's
1.	Identification and study of honey bee species. (Apis sp.) (Compulsory)	1 P
2.	Study of life cycle and caste system of honey bee. (Compulsory)	1 P
3.	Study of bee keeping equipments. (Compulsory)	1 P
4.	Study of honey bee diseases. Protozoan , Bacterial, Viral, Fungal.	1 P
5.	Specimen study of honey bee predators and enemies. (Compulsory)	1 P
6.	Study of products of apiculture and its economic importance. (Compulsory)	1 P
7.	Study of lac insect– morphology and life cycle. (Compulsory)	1 P
8.	Study of following crop pests with respect to marks of identification, nature of damage & control measures: -maize stem borer, sugarcane shoot borer, red cotton bug. (Compulsory)	1 P
9.	Study of following vegetable pests with respect to marks of identification, nature of damage & control measures - brinjal fruit borer, tomato fruit borer. (Compulsory)	1 P
10.	Study of following stored grain pests with respect to marks of identification, nature of damage & control measures -rice weevil, red flour beetle, pulse beetle. (Compulsory)	1 P
11.	Study of following fruit pests with respect to marks of identification, nature of damage & control measures - mango stem borer, pomegranate fruit borer. (Compulsory)	1 P
12.	Study of Plant Protection Appliances - hand sprayers, knapsack sprayer, power sprayer, Rotary duster, Power duster and agricultural drones . (Compulsory)	2 P
13.	Preparation of insecticide solutions of various ppm and percent. (Compulsory)	1 P

14.	Study of label, leaflet and colour code toxicity associated with insecticide containers .	1 P
15.	Study of selected edible insects and insect based feed (insect meal).	1 P
16.	Compulsory field visit to Agriculture farm / Apiculture unit/ wild life sanctuary and submission of report. (Compulsory)	2 P

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Syllabus from June 2026

SEMESTER- VI
Course Category-Vocational Skill Course (VSC)
Course Code-VSC-371-RE-DS-P
Paper Title: Dairy Science Practical-IV
Theory (Credit 2) No. of Hours: 60 Hours

Credits	Number of Teaching Hours	Internal Assessment	Semester End Exam	Total
02	30	15	35	50

Objectives:

- 1) To provide in depth knowledge and scientific information of Dairy Science 2) Understand the fundamentals of Dairy Science
- 2) To train students in skills related to Dairy plant and market.
- 3) To develop the good qualities of integrity, responsibility and self-confidence.
- 4) To familiarize with current and recent scientific and research development in the field of Dairy industry.
- 5) To enrich knowledge through hand on activities and study tour.
- 6) To instill safety practices and regulations

Course Outcomes:

- C01:** After completion of program, students will be able to have in depth knowledge of basic concepts in Dairy Science
- C02:** Student will learn about process and get knowledge of Dairy plant that help in further education.
- C03:** Students will become responsible and achieve self-confident.
- C04:** Students will be able to apply the knowledge of Dairy science in real life situations to solve the problems.
- C05:** Students develop aptitude of doing research through undertaking small projects and report writing.
- C06:** Students use safety practices and regulations inside Dairy industry

Sr. No.	Name of Practical (Any 15 practical's)	No. of Practical
1.	To Study Cleaning and Sterilizations of Dairy Utensils	1
2.	To Study Dairy farm Hygiene	1
3.	To Study Sampling of milk and milk products.	1
4.	Study the different platform tests	2
5.	To Study Milk Pasteurization	1

6.	To study Milk Homogenization	1
7.	Preparation of heat coagulated methods Khoa, Basundi, Rabri	2
8.	Preparation of Butter and Ghee	2
9.	Preparation of Frozen milk product Ice-cream	2
10.	Preparation of Indian sweet products: Pedha, Gulabjamun and Rasgulla.	2
11.	Visit to dairy plant/ Industry	2

Note:

1. A student has to perform at list fifteen experiments in semester and study tour and report writing.
2. In lieu of study tour students will have to perform two more practicals.

Field Visit: The students shall be taken for an industrial visit to Dairy industries to witness and understand the various processes of manufacturing of milk products. Individual reports from each student on their learning experience from the field visit shall be submitted.

References:

1. Animal Husbandry - by G.C. Banarjee
2. Animal Nutrition - by G.C. Banarjee
3. Handbook of Dairy Science - by I.C.A.R.
4. Handbook of Agriculture - by I.C.A.R.
5. Text book of Animal Science Technology - H.S.C. Board
6. Milk and milk products – Winton and Winton (1993) Agrobios (India), Agro. House behind Nasrani cinema. Chopsani road Jodhapur.
7. Milk Testing – Davis.J.G. Agribios (India) Agro house behind Nasrani cinema Chopsani road Jodhapur.
8. Chemistry of milk and milk products. Singh V.B. (1965) Asian publishers. New mandi. Muzaffaranagar.
9. Dairy Science: Petersen (W.E.) Publisher – Lippincott & Company
10. Outlines of Dairy Technology – Sukumar (De) – Oxford University press
11. Indian Dairy Products – Rangappa (K.S.) & Acharya (KT) – Asia Publishing House.
12. The technology of milk Proceesing – Anantha krishnan, C.P., Khan, A.Q. and Padmanabhan, P.N.Shri Lakshmi Publications.
13. Dairy India 2007, Sixth edititon
14. Economics of Milk Production – Bharati Pratima Acharya Publishers.

Community Engagement Program (CEP)

SEMESTER	SUBJECT CODE	SUBJECT TITLE
VI	CEP-381-RE-PC	Pharmaceutical Chemistry -CEP
VI	CEP-382-RE-ES	Energy Studies-CEP
VI	CEP-383-RE-HM	Horticulture and Its Management-CEP
VI	CEP-384-RE-AE	Applied Entomology-CEP
VI	CEP-385-RE-DS	Dairy Science-CEP

T. Y. B. Sc. RESTRUCTURING PATTERN [Semester - VI]

Course Category: Community Engagement Program (CEP)

Course Code – CEP-381-RE-PC (Pharmaceutical Chemistry- CEP)

[No. of Credits: 2 C]

[No. of Lectures: 60 L]

Guidelines for Community Engagement Project in the Field of Pharmaceutical Chemistry

Introduction

Community engagement is an important component of pharmaceutical education that connects academic knowledge with societal needs. In Pharmaceutical Chemistry, community engagement projects provide students with opportunities to apply their understanding of medicines, health, and disease prevention to address public health concerns. Through activities such as health awareness campaigns, medication safety education, rational drug use programs, and community surveys, students interact with diverse populations and contribute to improving healthcare awareness. These projects foster social responsibility, communication skills, ethical values, and a deeper understanding of the role of pharmaceutical professionals in promoting community health and well-being.

Objectives of Community Engagement Project

1. To promote active participation of students in community health and wellness activities.
2. To apply pharmaceutical chemistry knowledge for addressing community healthcare needs and challenges.
3. To create awareness among the public regarding the safe and rational use of medicines.
4. To understand the health, hygiene, and medication-related issues prevalent in the community.
5. To provide experiential learning opportunities through health education, surveys, and outreach programs.
6. To develop skills in identifying, analyzing, and preparing and presenting comprehensive reports documenting community engagement activities, observations, outcomes, and reflections. n and community service through pharmaceutical education.

Course Outcomes

After completion of the Community Engagement Project, students will be able to:

- Identify and assess common health and medication-related issues prevailing in the community.
- Apply pharmaceutical chemistry knowledge to promote safe, effective, and rational use of medicines among the public.
- Design and implement community-based health awareness and educational activities.
- Collect, analyze, and interpret community health data through surveys, field visits, and outreach activities.
- Recommend appropriate health and medication-related interventions based on community needs and scientific evidence.
- Prepare and present comprehensive reports documenting community engagement activities, observations, outcomes, and reflections.

Major Areas of Community Engagement Project

- 1. Rational Use of Medicines**
Awareness on proper use of prescription and over-the-counter medicines
Prevention of self-medication and misuse of drugs
- 2. Medication Safety Awareness**
Safe storage and handling of medicines
Understanding medicine labels and expiry dates
Prevention of medication errors
- 3. Public Health Education**
Awareness programs on common diseases and their prevention
Promotion of healthy lifestyles and disease prevention practices
- 4. Antimicrobial Resistance (AMR) Awareness**
Educating the public about responsible antibiotic use
Prevention of antibiotic resistance through proper medication practices
- 5. Health and Hygiene Promotion**
Personal hygiene and sanitation awareness
Prevention of communicable diseases
- 6. Pharmacovigilance Awareness**
Educating the community about adverse drug reactions (ADRs)
Importance of reporting medicine-related side effects
- 7. Herbal Medicines and Traditional Remedies**
Awareness regarding the safe use of herbal products
Identification of potential risks and drug-herb interactions
- 8. Medicine Disposal and Environmental Safety**
Safe disposal of expired and unused medicines
Reducing pharmaceutical waste and environmental contamination
- 9. Lifestyle Disorders Awareness**
Education on diabetes, hypertension, obesity, and cardiovascular diseases
Role of medications and lifestyle modifications in disease management
- 10. Nutrition and Health Awareness**
Importance of balanced nutrition and dietary supplements
Prevention of nutritional deficiencies

Role of Students

1. Engage enthusiastically in all community engagement activities and field visits.
2. Identify community health issues and participate in selecting relevant project topics.
3. Assist in preparing project proposals, action plans, and schedules.

4. Conduct awareness programs, surveys, interviews, and educational activities respectfully and professionally.
5. Promote awareness regarding the safe and rational use of medicines.
6. Educate the community on health, hygiene, disease prevention, and medication safety.
7. Collect, record, and maintain accurate information from surveys, observations, and field activities.
8. Respect community values, culture, and privacy.
9. Work cooperatively with team members and contribute to group activities.
10. Conduct activities in a responsible and professional manner.
11. Analyze collected information and prepare a comprehensive project report.

Role of Faculty/Program Coordinator

1. Assist students in selecting suitable community engagement activities and project topics.
2. Help define project objectives, methodology, and expected outcomes.
3. Review and approve project proposals, action plans, and timelines before implementation.
4. Ensure that the selected activities are relevant to pharmaceutical chemistry and community needs
5. Support the organization of field visits and outreach activities.
6. Regularly review students' progress and provide constructive feedback.
7. Ensure timely completion of project activities according to the approved schedule.
8. Assist students in data collection, analysis, and interpretation.
9. Ensure students follow appropriate safety measures during field activities.
10. Guide students in preparing a structured and scientifically sound project report.
11. Encourage the development of social responsibility, leadership, and community-oriented professional values.

Documentation and Report Preparation

The final report should include:

- Title of program
- Objectives
- Date and location
- Details of participants
- Activities conducted
- Photographs and survey data
- Observations and outcomes
- Problems identified in the community
- Suggestions and recommendations
- Conclusion

Evaluation Criteria

Criteria	Marks (%)
Participation and Discipline	20
Communication and Teamwork	20
Field Activities and Practical Work	30
Report Preparation	20

Presentation/Viva	10
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T. Y. B. Sc. RESTRUCTURING PATTERN

Course Category –Community Engagement Program (CEP) [Semester - VI]

Course Code – CEP-382-RE-ES Energy Studies-CEP

[No. of Credits: 2 C]

[No. of Lectures: 60 L]

Guidelines for Community Engagement Program in the Field of Energy Studies

Introduction

Community Engagement Programs in Energy Studies are organized to connect educational institutions, students, local communities, industries, and government agencies for promoting awareness of energy conservation, renewable energy technologies, and sustainable energy practices. These programs provide students with practical exposure to real-world energy challenges while encouraging community participation in the efficient use of energy resources and environmental protection.

Objectives of Community Engagement Program

1. To create awareness among the public about energy conservation and efficient energy use.
2. To promote the adoption of renewable energy technologies such as solar, wind, and biogas systems.
3. To provide practical exposure to students through community interaction and field activities.
4. To disseminate scientific knowledge related to sustainable energy practices in local communities.
5. To encourage the use of clean and environmentally friendly energy resources.
6. To develop communication, leadership, and teamwork skills among students.
7. To strengthen collaboration between educational institutions, communities, industries, and government agencies in the field of energy management.

Course Outcomes

After completion of the Community Engagement Program, students will be able to:

1. Communicate scientific concepts of Energy Studies effectively to communities and stakeholders.
2. Understand real-world energy challenges and energy consumption practices in society.
3. Apply practical knowledge of renewable energy and energy conservation in community settings.
4. Develop leadership, teamwork, communication, and social responsibility skills.
5. Promote awareness about renewable energy technologies and sustainable energy practices.
6. Contribute to environmental protection and sustainable development through energy awareness initiatives.

Major Areas of Community Engagement

1. Energy Awareness Programs

- Importance of energy conservation and efficient energy utilization in daily life
- Renewable and non-renewable energy sources: solar, wind, biomass, and conventional fuels
- Environmental impacts of energy consumption and the benefits of clean energy technologies
- Government schemes and incentives for renewable energy adoption
- Energy-saving practices in homes, schools, and public institutions
- Role of renewable energy in sustainable development and environmental protection

2. Training and Workshops

- Hands-on training on solar energy devices and energy-saving practices
- Demonstration of solar cookers, solar water heaters, and solar photovoltaic systems
- Career and entrepreneurship opportunities in the renewable energy sector

3. Surveys and Data Collection

- Household electricity consumption survey
- Renewable energy awareness and adoption studies
- Problems faced by communities related to energy access, energy costs, and energy conservation

Guidelines for Conducting the Program

1. Planning and Preparation

- Identify community needs related to energy and energy conservation.
- Select suitable topics related to renewable energy and sustainable energy practices.
- Prepare awareness materials, posters, charts, and simple demonstrations.
- Coordinate with local authorities, educational institutions, NGOs, or renewable energy organizations for program implementation.

2. Selection of Location

Programs may be conducted at:

- Villages and local communities
- Schools and colleges
- Residential societies and public institutions
- Renewable energy sites such as solar installations and biogas plants

Role of Students

1. Participate actively in energy awareness campaigns, workshops, and field demonstrations.
2. Interact respectfully with community members and promote awareness about energy

conservation and renewable energy.

3. Conduct surveys and collect information related to energy consumption and energy practices.
4. Assist in demonstrations of solar energy devices, energy-efficient appliances, and renewable energy technologies.
5. Prepare educational materials, posters, charts, and presentations.
6. Maintain records, photographs, and reports of community engagement activities.
7. Promote sustainable energy practices and environmentally responsible behavior in the community.

Role of Faculty/Program Coordinator

1. Guide students during the planning and implementation of community engagement activities.
2. Arrange expert lectures, demonstrations, and technical support related to energy studies.
3. Coordinate with local communities, government agencies, educational institutions, and renewable energy organizations.
4. Monitor student participation and assess the effectiveness of the program.
5. Evaluate student reports and provide constructive feedback.

Suggested Community Engagement Activities

Sr. No.	Activity
1	Awareness campaign on energy conservation
2	Demonstration of solar cooker and solar water heater
3	Community training on efficient use of electrical appliances
4	Awareness program on renewable energy sources
5	Household survey on electricity consumption patterns
6	Demonstration of solar photovoltaic systems
7	Awareness campaign on energy-saving practices
8	Exhibition on renewable energy technologies
9	Distribution of educational pamphlets and posters on energy conservation
10	Workshop on career and entrepreneurship opportunities in renewable energy
11	Awareness program on environmental benefits of clean energy
12	Demonstration of energy-efficient lighting systems (LEDs)
13	Community awareness program on solar energy applications
14	Interaction with renewable energy experts and professionals
15	Field visit to solar power plants, biogas plants, or renewable energy installations

Documentation and Report Preparation

The final report should include:

- Title of program
- Objectives
- Date and location
- Details of participants
- Activities conducted
- Photographs and survey data
- Observations and outcomes
- Problems identified in the community
- Suggestions and recommendations
- Conclusion

Evaluation Criteria

Criteria	Marks (%)
Participation and Discipline	20
Communication and Teamwork	20
Field Activities and Practical Work	30
Report Preparation	20
Presentation/Viva	10

Organizations that may support community engagement activities include:

- Renewable Energy and Solar Installation Companies
- Schools and Colleges in the local area
- Solar Energy Installation and Service Providers
- Biogas Plant Owners and Renewable Energy Users
- Communication with progressive farmers using solar pumps and biogas systems
- Participation in Science Exhibitions, Energy Awareness Programs, and Renewable Energy Exhibitions

T. Y. B. Sc. RESTRUCTURING PATTERN

Course Category –Community Engagement Program (CEP) [Semester - VI]

Course Code – CEP-383-RE-HM (Horticulture and Its Management- CEP)

[No. of Credits: 2 C]

[No. of Lectures: 60 L]

Guidelines for Community Engagement Program in the Field of Horticulture and its Management

Introduction

Community Engagement Programs in Horticulture and its Management are organized to connect educational institutions, students, farmers, fruit industries and rural communities for the promotion of quality fruit production, awareness, and sustainable agricultural

practices. These programs help students gain practical exposure while contributing to community development.

Objectives of Community Engagement Program

- To create awareness among farmers about quality fruit crop and modern technologies.
- To promote the use of certified and high-quality fruits for better fruit production.
- To provide practical exposure to students through community interaction and field activities.
- To transfer scientific knowledge and improved agricultural practices to rural communities.
- To encourage sustainable agriculture and fruit crop variety conservation practices.
- To develop communication, leadership and teamwork skills among students.
- To strengthen collaboration between educational institutions, farmers, and Fruit industries.

Course Outcomes

After completion of the Community Engagement Program, students will be able to:

- Communicate scientific Horticulture and its Management concepts effectively to farmers and communities.
- Understand real agricultural problems related to fruit crop production and quality.
- Apply practical knowledge in field situations.
- Develop leadership, teamwork, and social responsibility.
- Promote awareness about quality fruit and sustainable agricultural practices.
- Contribute to rural development and agricultural productivity improvement.

Major Areas of Community Engagement

1. Farmer Awareness Programs

- Importance of fruits
- Improved fruit crop varieties
- Government schemes related to fruit crop and agriculture
- Hybrid fruit crop Production Demonstrations
- Field preparation and sowing methods
- Layout methods
- Propagation methods techniques
- Good Quality of plant and Testing Awareness
- Germination methods
- Fruit storage techniques
- Identification of healthy and diseased fruit
- Sustainable and Organic Practices
 - Organic seed production
 - Biofertilizers and biopesticides
 - Indigenous seed conservation

2. Training and Workshops

- Hands-on training for farmers and self-help groups
- Demonstration of fruit processing equipment
- Entrepreneurship opportunities in fruit business

3. Surveys and Data Collection

- Farmer seed usage survey
- Crop performance studies
- Problems faced by farmers in good quality saplings availability

Guidelines for Conducting the Program

1. Planning and Preparation

- Identify community needs and target groups.
- Select suitable topics related to Horticulture and its Management.
- Prepare training materials, charts, posters, and demonstrations.
- Coordinate with local agriculture officers, agriculture research institutes, companies, or farmer groups.

2. Selection of Location

Programs may be conducted at:

- Villages and rural communities
- Farmer training centers
- Agricultural schools and colleges
- Fruit farms and demonstration plots

Role of Students

- Participate actively in awareness campaigns and field demonstrations.
- Interact respectfully with farmers and community members.
- Conduct surveys and collect field information accurately.
- Assist in demonstrations of fruit treatment and testing methods.
- Prepare educational materials and presentations.
- Maintain records, photographs, and reports of activities.
- Promote scientific and environmentally friendly farming practices.

Role of Faculty/Program Coordinator

- Guide students during planning and execution of activities.
- Arrange expert lectures and technical support.
- Coordinate with government departments and local organizations.
- Monitor student participation and program effectiveness.
- Evaluate reports and provide feedback.

Suggested Community Engagement Activities

Sr. No.	Activity
1	Awareness campaign on certified seeds
2	Demonstration of fruit seed germination testing
3	Farmer training on fruit seed treatment methods
4	Fruit storage management awareness program
5	Village survey on fruit garden usage practices
6	Demonstration of hybrid sapling production
7	Organic fruit production awareness
8	Exhibition on improved crop varieties

Sr. No.	Activity
9	Distribution of educational pamphlets/posters
10	Workshop on entrepreneurship in fruit garden business
11	Awareness on fruit -borne diseases and control
12	Demonstration of fruit grading and cleaning
13	Community local variety plants awareness program
14	Farmer interaction with agriculture scientist experts
15	Field visit to fruit orchard production farms

Documentation and Report Preparation

The final report should include:

- Title of program
- Objectives
- Date and location
- Details of participants
- Activities conducted
- Photographs and survey data
- Observations and outcomes
- Problems identified in the community
- Suggestions and recommendations
- Conclusion

Evaluation Criteria

Criteria	Marks (%)
Participation and Discipline	20
Communication and Teamwork	20
Field Activities and Practical Work	30
Report Preparation	20
Presentation/Viva	10

Organizations that may support community engagement activities include:

- Indian Council of Agricultural Research
- Krishi Vigyan Kendra
- National Fruit Corporation
- State Department of Agriculture
- Various fruit processing industries
- Formation of Farmers club
- Communication with progressive farmers
- Attend Agriculture Exhibition

T. Y. B. Sc. RESTRUCTURING PATTERN

Course Category – Community Engagement Program (CEP) [Semester - VI]

Course Code– CEP-384-RE-AE (Applied Entomology -CEP)

[No. of Credits: 2 C]

[No. of Lectures: 60 L]

Guidelines for Community Engagement Program in the Field of Applied Entomology

Introduction

Community Engagement Programs in Applied Entomology are organized to connect educational institutions, students, farmers, agricultural agencies, and rural communities for promoting scientific insect pest management, biological control, pollinator conservation, and sustainable agricultural practices. These programs provide students with practical exposure to real-world agricultural challenges while contributing to community awareness, environmental sustainability, and rural development.

Objectives of Community Engagement Program

1. To create awareness about insect pest management and beneficial insects.
2. To promote Integrated Pest Management (IPM) and biological control methods.
3. To provide practical exposure through community and field activities.
4. To transfer scientific knowledge to farmers and rural communities.
5. To encourage sustainable and eco-friendly agricultural practices.
6. To develop communication, leadership, and teamwork skills.
7. To strengthen links between educational institutions, farmers, and agricultural organizations.

Course Outcomes

After completion of the Community Engagement Program, students will be able to:

1. Communicate Applied Entomology concepts effectively to farmers and communities.
2. Understand field problems related to insect pests and crop protection.
3. Apply practical knowledge of pest management in field situations.
4. Develop leadership, teamwork, and social responsibility.
5. Promote awareness about Integrated Pest Management (IPM) and sustainable agricultural practices.
6. Contribute to rural development and environmentally friendly crop protection.

Major Areas of Community Engagement

1. Farmer Awareness Programs

- Importance of beneficial insects and pollinators
- Major insect pests of agricultural crops
- Integrated Pest Management (IPM)
- Safe and judicious use of pesticides
- Biological control methods
- Organic and eco-friendly pest management
- Government schemes related to agriculture and crop protection

2. Training and Workshops

- Hands-on training on insect pest identification
- Demonstration of pheromone traps, light traps, and biocontrol agents
- Beekeeping and pollinator management
- Entrepreneurship opportunities in apiculture and sericulture

3. Surveys and Data Collection

- Survey of major crop pests in local areas
- Farmer awareness regarding pest management practices
- Problems faced by farmers in insect pest control and crop protection

Guidelines for Conducting the Program

1. Planning and Preparation

- Identify community needs and target groups.
- Select suitable topics related to Applied Entomology.
- Prepare training materials, charts, posters, and demonstrations.
- Coordinate with agricultural officers, research institutes, NGOs, and farmer groups.

2. Selection of Location

Programs may be conducted at:

- Villages and rural communities
- Farmer training centers
- Agricultural schools and colleges

- Farms, apiaries, and demonstration plots

Role of Students

- Participate actively in awareness campaigns and field demonstrations.
- Interact respectfully with farmers and community members.
- Conduct surveys and collect field information accurately.
- Assist in demonstrations of pest management and biological control methods.
- Prepare educational materials and presentations.
- Maintain records, photographs, and reports of activities.
- Promote scientific and eco-friendly agricultural practices.

Role of Faculty/Program Coordinator

- Guide students during planning and execution of activities.
- Arrange expert lectures and technical support.
- Coordinate with government departments and local organizations.
- Monitor student participation and program effectiveness.
- Evaluate reports and provide feedback.

Suggested Community Engagement Activities

Sr. No.	Activity
1	Awareness campaign on Integrated Pest Management (IPM)
2	Demonstration of insect pest identification techniques
3	Farmer training on safe and judicious use of pesticides
4	Awareness program on biological control methods
5	Village survey on major crop pests and their management
6	Demonstration of pheromone traps and light traps
7	Awareness on organic and eco-friendly pest management
8	Exhibition on beneficial insects and pollinators
9	Distribution of educational pamphlets and posters on pest management
10	Workshop on entrepreneurship in apiculture and sericulture
11	Awareness on vector-borne diseases and mosquito control
12	Demonstration of insect collection and preservation methods
13	Community awareness program on insect biodiversity conservation

14	Farmer interaction with entomology experts and agricultural scientists
15	Field visit to biocontrol laboratories, apiaries, or agricultural farms

Documentation and Report Preparation

The final report should include:

1. Title of the Program
2. Objectives
3. Date and Location
4. Details of Participants
5. Activities Conducted
6. Photographs and Survey Data
7. Observations and Outcomes
8. Problems Identified in the Community
9. Suggestions and Recommendations
10. Conclusion
11. References (if any)
12. Annexures/Appendices (if applicable)

Evaluation Criteria

Criteria	Marks (%)
Participation and Discipline	20
Communication and Teamwork	20
Field Activities and Practical Work	30
Report Preparation	20
Presentation/Viva	10

Organizations that may support community engagement activities include:

- Indian Council of Agricultural Research (ICAR)
- Krishi Vigyan Kendra (KVK)
- National Centre for Integrated Pest Management (NCIPM)
- State Department of Agriculture
- Agricultural Universities and Research Institutes

- Biological Control Laboratories
- Apiculture and Sericulture Development Centers
- Farmer Producer Organizations (FPOs) and Farmers' Clubs
- Progressive Farmers and Agricultural Extension Agencies
- Participation in Agricultural Exhibitions, Workshops, and Farmer Fairs

T. Y. B. Sc. RESTRUCTURING PATTERN**Course Category – Community Engagement Program (CEP) [Semester - VI]****Course Code– CEP-385-RE-DS Dairy Science-CEP****[No. of Credits: 2 C]****[No. of Lectures: 60 L]****Guidelines for Community Engagement Program in the Field of Dairy Science****Introduction**

Community Engagement Programs in Dairy Science are organized to connect educational institutions, students, farmers, Dairy industries and rural communities for the promotion of quality milk production, awareness, and sustainable dairy practices. These programs help students gain practical exposure while contributing to community development.

Objectives of Community Engagement Program

- To create awareness among farmers about quality milk and modern technologies.
- To promote the use of high-quality breeds for better milk production.
- To provide practical exposure to students through community interaction and dairy farm activities.
- To transfer scientific knowledge and improved dairy practices to rural communities.
- To encourage sustainable dairy and milk conservation practices.
- To develop communication, leadership and teamwork skills among students.
- To strengthen collaboration between educational institutions, farmers, and Dairy industries.

Course Outcomes

After completion of the Community Engagement Program, students will be able to:

- Communicate scientific Dairy Science concepts effectively to farmers and communities.
- Understand real Dairy farm problems related to milk production and quality.
- Apply practical knowledge in field situations.
- Develop leadership, teamwork, and social responsibility.
- Promote awareness about quality milk and sustainable Dairy farm/agricultural practices.
- Contribute to rural development and Dairy animal milk productivity improvement.

Major Areas of Community Engagement**1. Farmer Awareness Programs**

- Importance of milk
- Improved Cow breeds
- Government schemes related to milk producer farmers
- Dairy farm establishment techniques.
- Dairy farm Layout methods
- Milking methods and techniques
- Good Quality milk and Testing Awareness
- Milk processing and storage techniques
- Identification of healthy and diseased milk
- Cleaning and sterilization of dairy utensils Practices

2. Training and Workshops

- Hands-on training for farmers and self-help groups
- Demonstration of milk processing equipment
- Entrepreneurship opportunities in Dairy business

3. Surveys and Data Collection

- Milk producer Farmer survey
- Comparative milk production survey of local and Exotic cow breeds
- Problems faced by farmers in good quality milk production techniques.

Guidelines for Conducting the Program

1. Planning and Preparation

- Identify community needs and target groups.
- Select suitable topics related to Dairy Science.
- Prepare training materials, charts, posters, and demonstrations.
- Coordinate with local Veterinary officers, Dairy research institutes, Dairy milk industries, or farmer groups.

2. Selection of Location

Programs may be conducted at:

- Villages and rural communities
- Farmer training centers
- Agricultural schools and colleges
- Dairy farms and demonstration plots

Role of Students

- Participate actively in awareness campaigns and farm demonstrations.
- Interact respectfully with farmers and community members.
- Conduct surveys and collect dairy farm information accurately.
- Assist in demonstrations of milk testing methods.
- Prepare educational materials and presentations.
- Maintain records, photographs, and reports of activities.
- Promote scientific and environmentally friendly farming practices.

Role of Faculty/Program Coordinator

- Guide students during planning and execution of activities.
- Arrange expert lectures and technical support.
- Coordinate with government departments and local organizations.
- Monitor student participation and program effectiveness.
- Evaluate reports and provide feedback.

Suggested Community Engagement Activities

Sr. No.	Activity
1	Awareness campaign on hygiene in milk production
2	Demonstration of milk testing
3	Farmer training on milking methods
4	Milk Processing and storage management awareness program
5	Village survey on milk usage practices

Sr. No.	Activity
6	Demonstration of milk products preparation
7	Milk production awareness
8	Exhibition on improved cow breeds
9	Distribution of educational pamphlets/posters
10	Workshop on entrepreneurship in Dairy business
11	Awareness on milk-borne diseases and control
12	Demonstration of cleaning and sterilization of dairy utensils.
13	Community local Cow milk production awareness program
14	Farmer interaction with Dairy scientist and experts
15	Field visit to Dairy industry and Dairy cattle farms

Documentation and Report Preparation

The final report should include:

- Title of program
- Objectives
- Date and location
- Details of participants
- Activities conducted
- Photographs and survey data
- Observations and outcomes
- Problems identified in the community
- Suggestions and recommendations
- Conclusion

Evaluation Criteria

Criteria	Marks (%)
Participation and Discipline	20
Communication and Teamwork	20
Field Activities and Practical Work	30
Report Preparation	20
Presentation/Viva	10

Organizations that may support community engagement activities include:

- National Dairy Development Board
- National Dairy Corporation
- State Department of Animal husbandry
- Various milk processing industries
- Formation of Milk producer Farmers club
- Communication with progressive farmers
- Attend Agriculture Exhibition