

Syllabus for B.Sc. Third year
Subject: AGROCHEMICALS AND FERTILISERS
V th semester

Paper no	Code. no	Title	Periods /week	Total periods	Marks
XII	CH-AG-301	Agronomy and seed Technology	3	45	50
XIII	CH-AG-302	Horticulture	3	45	50

VIth semester

Paper no.	Code. no	Title	Periods /week	Total periods	Marks
XIV	CH-AG-303	Preservation of fruits and vegetables	3	45	50
XV	CH-AG-304	Agricultural Technology	3	45	50
XVI	CH-AG-305	Laboratory Course - IV	4	120	50
XVII	CH-AG-306	Laboratory Course - V	4	120	50

**Paper – XII Agronomy and Seed Technology
(CH-AG-301)**

Periods : 45

Unit –I

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|--|-----------|
| 1. Introduction to Agronomy | 06 |
| Definition, Scope | |
| Relationship with other sciences | |
| Factors governing Crop Production | |
| Agro- climatic Zones of Maharashtra | |
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| 2. Tillage and tillage implements : | 05 |
| Introduction | |
| Objects of tillage | |
| Type of tillage operations | |
| Tillage implements | |
| Modern concepts of tillage | |

Unit -II

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|--|-----------|
| 3. Dry Land Management | 06 |
| Introduction | |
| Importance | |
| Problems of dry land farming | |
| Management of dry land farming | |
| Water shed management - definition and objectives | |
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| 4. Package of practices for important field crops | 08 |
| Cotton | |
| Jowar (Sorghum) | |
| Sugarcane | |
| Soya bean | |

Unit –III

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|---|-----------|
| 5. Introduction to seed Technology | 06 |
| Definition of seed and seed technology | |
| Characteristics of good quality seeds | |
| Types of seeds | |
| Seed dormancy | |
| Seed treatment | |
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| 6. General Principles of seed production | 04 |
| Genetic Principles | |
| Agronomic Principles | |

Unit -IV

7. Seed certification and seed legislation

10

Seed certification- objectives, fundamental concepts

Organization of Seed certification

Seed certification agency

General seed certification Standards

Seed testing

Seed legislation in India.

Paper XIII Horticulture
(CH-AG-302)

Periods : 45

Unit -I

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|--|-----------|
| 1. Introduction to Horticulture | 04 |
| Definition | |
| Branches of horticulture | |
| Importance and scope of horticulture in India | |
| 2. Propagation of horticulture crops | 08 |
| Definition, | |
| Principles and methods of propagation of fruit crops | |
| Propagation by seeds | |
| Propagation by cuttings, grafting, budding, and layerage | |

Unit -II

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|---|-----------|
| 3. Package of practices for important fruit crops of Maharashtra | 08 |
| Mango | |
| Grapes | |
| Banana | |
| Guava | |

Unit-III

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|---|-----------|
| 4. Olericulture | 07 |
| Definition | |
| Scope and importance of vegetable growing | |
| Classification of vegetable | |
| Types of vegetable gardens | |
| 5. Package of Practices for important vegetable crops | 10 |
| Chillies | |
| Onion | |
| Tomato | |
| Brinjal | |
| Bhendi(okra) | |
| (Package of practices include area and production, varieties, climatic requirements cultivation practices, manuring, irrigation, plant protection and economic importance.) | |

Unit –IV

6. Floriculture

08

Introduction

Methods of cultivation

Important flower crops of Maharashtra state

Handling, transportation and storage of floriculture products

Export potential in floriculture

**Paper XIV Preservation of Fruits and Vegetables
(CH-AG-303)**

Period 45

Unit-I

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|---|-----------|
| 1. Post harvest technology for fruits and vegetables | 05 |
| Harvesting, storage and marketing of fruits | |
| Harvesting, grading, packaging, marketing and storage of vegetables | |
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| 2. Preservation of fruits and vegetables | 08 |
| Spoilage of fruits and vegetables | |
| Importance and Principles of Preservation | |
| Methods of Preservation | |
| Chemical preservatives – types and uses | |

Unit-II

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|--|-----------|
| 3. Canning and bottling of fruits and vegetables | 02 |
| Canned mango and canned vegetables | |
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| 4. Fruit beverages | 04 |
| Preparation of fruit juices ,squashes, cordials | |
| Preparation of orange and lemon squash | |
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| 5. Preparation of jams, jellies, | 06 |
| Preparation of guava jelly, apple jam .mango jam, Amla jam | |

Unit-III

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| 6. Drying and dehydration of fruits and vegetables | 06 |
| Methods –sun drying, mechanical dehydration, drum drying | |
| Preparation of raisins from grapes. Banana products like chips and powders | |
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| 7. Preparation and preservation of pickles | 04 |
| Preparation of mango, lime ,chillies and vegetable pickles, | |

Unit-IV

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|---|-----------|
| 8. Preparation of crystallized fruits | 04 |
| Preparation of Amala Candy | |
| 9. Preparation of Tomato products | 02 |
| Tomato Ketchup and puree | |
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| 10. Preparation of fermented vegetables | 02 |
|
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| 11. Irradiation to reduce post harvest losses of fruits and vegetables | 02 |

**Paper –XV Agricultural Technology
(CH-AG-304)**

Periods :45

Unit -I

1. Problematic soils	10
Introduction to saline and alkali soils	
Classification	
Diagnostic criteria and causes of their formation	
Adverse effects	
Reclamation and management of saline and alkali soils	
Introduction to acidic Soils	
Sources of soil acidity	
Reclamation of acidic soils	

Unit -II

2. Hydroponics	04
Methods of soil-less cultivation	
Nutrient film technique (NFT)	
Advantages and disadvantages of hydroponics	
Applications of hydroponics in agriculture	
3. Micro- propagation techniques	06
Introduction	
Types of micro- propagation	
Techniques of tissue culture and its applications in agriculture	

Unit – III

4. Green house technology	06
Introduction	
Components and design of green houses	
Advantages	
Applications in agriculture	
5. Micro- irrigation	08
Introduction	
Drip and sprinkler irrigation systems, their components	
Advantages	
Their importance in water management	

Unit –IV

- 6. Soil and water conservation** **08**
- Soil erosion- definition and types
 - Importance
 - Methods of soil and water management
 - Waste land reclamation
 - Watershed management- definition and objectives
 - Water harvesting- definition , methods of water harvesting
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- 7. Biopesticides** **03**
- Introduction ,
 - Types ,
 - Applications and importance

Laboratory Course –IV
Paper –XVI
(CH-AG-305)

Duration of practical –Four periods
(At least sixteen practicals are essential)

1. Study of tillage implements
2. Visit to the field to observe the package of practices for any field crop
3. Preparation of various types of nursery beds
4. study and practice of grafting technique
5. study and practice of budding technique
6. study and Practice of Layering Technique
7. Study and practice of propagation through cuttings
8. Study of garden tools and implements
9. Determination of seed moisture
10. Determination of germination percentage of seeds
11. Delinting of cotton seeds
12. Application of Azotobacter / Rhizobium culture on seed and observe their effect on crops
13. Use of growth regulators in plant propagation
14. Visit to the fruit orchards /vegetable garden to study the package of practices
15. Visit to seed production plot
16. Visit to seed testing laboratory
17. Study of physical purity analysis of seeds
18. To study the seed germination methods. (C& P, B.P., Sand)
19. Filling of application form for seed certification
20. To study seed quality testing

Laboratory Course –V

Paper XVII

CH-AG-306

Duration of practicals -4 periods

(At least sixteen practicals are essential)

1. Preparation and use of soil testing kit for determination of available N,P, K
2. Estimation of total soluble salts in 1:2.5 soil water extracts.
3. Preparation and preservation of fruit juice
4. Preparation and preservation of squash
5. Preparation of fruit jam
6. Preparation of fruit jelly
7. Determination of gypsum requirement of soil
8. Determination of carbonates and bicarbonates from irrigation water
9. Determination of chlorides from irrigation water
10. Determination of sulphates from irrigation water
11. Determination of electrical conductivity of irrigation water /soil
12. Dehydration of Banana /Grapes
13. Preparation and preservation of pickles
14. Visit to the fruit preservation industry
15. Visit to the farm and diagnosis of field problems
16. Drying /dehydration of vegetables cabbage /potato /beans
17. Study of drip irrigation components /field visit
18. Study of sprinkler irrigation components /field visit
19. Determination of lime requirement of soil
20. Visit to green house to observe its design and working

Reference books for B.Sc. IIIrd year

1. Introduction to Agronomy –soil and water management.— Vaidhya and Sahasrabudde
2. Principles of Agronomy- Reddy and Reddi
3. Crop production and field experimentation – Vaidya and Saharabudhe and Khuspe
4. Seed Technology – Ratanlal Agrawal
5. Text book of Horticulture –K. Manibhushanrao
6. Basic Horticulture –Jitendrasingh
7. Fruit Growing - J.S. Bal
8. Fruit Physiology and Production- Amarsingh
9. Basic concept of fruit science –N.P.Singh
10. Fruits – Ranjeet Singh and Saxena
11. Floriculture in India –Randhwa and Mukhopadhyaya
12. Vegetable Growing –Chauhan
13. Vegetable science –Hazara and Som
14. Green house Technology –Arupratan Ghosh
15. Handbook of Saline and alkali soils -USDA
16. Vegetable Production in India- D.V.S.Chauhan
17. Vegetable growing in India – P.S. Arya and Santprakash
18. vegetable growing – Choudhary
19. Horticulture at glance- Amarsingh
20. Plant Propagation – Hertman et al
21. Preservation of fruits and Vegetables -Girdharilal and Tondon
22. Principles of fruit growing – Yawalkar and Kunte
23. Horticulture for competitive and college Exam- Suhas Diwase
24. Horticulture main book for Competitive Exam - R. N. Sable
25. Agriculture M.P.S.C. Main Exam- R. N. Sable
26. Foods and Nutrition – Sumati Mudambi
27. Plant Physiology- Pandey and Sinha
28. Plant physiology –Jain
29. Hand book of Agriculture –ICAR Publications
30. Sprinkler Irrigation – WALMI Publication
31. Drip Irrigation – WALMI Publication