

# **SHIVAJI UNIVERSITY, KOLHAPUR**



Accredited By NAAC with 'A' Grade

**Faculty of Interdisciplinary Studies  
Structure, Scheme and Syllabus for  
Bachelor of Vocation (B. Voc.)**

**Horticulture and Floriculture  
Part II- Sem. III & IV**

**Syllabus to be implemented from**

(Subject to the modifications that will be made from time to time)  
Syllabus to be implemented from June, 2021 onwards.

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**STRUCTURE AND SYLLABUS OF B.VOC.**  
**Bachelor of Vocation (B.Voc.) – Horticulture and Floriculture**

|                                |   |
|--------------------------------|---|
| <b>TITLE</b>                   | : B.Voc. (Horticulture and Floriculture)<br>Syllabus ( Semester Pattern)<br>Under Faculty of Interdisciplinary Studies  |
| <b>YEAR OF IMPLEMENTATION</b>  | : Syllabus will be implemented from June, 2020  |
| <b>DURATION</b>                | : B. Voc. Part I, II and III ( ThreeYears)<br>B. Voc. Part I - Diploma ( One Year )<br>B. Voc. Part II - Advanced Diploma ( Second Year)<br>B. Voc. Part III – Degree ( ThirdYear)  |
| <b>PATTERN OF EXAMINATION</b>  | : Semester Pattern  |
| • <b>Theory Examination</b>    | - At the end of semester as per Shivaji University Rules  |
| • <b>Practical Examination</b> | - i) In the 1 <sup>st</sup> , 3 <sup>rd</sup> and 5 <sup>th</sup> semester of B.Voc. there will be internal assessment of practical record, related report submission and project reports at the end of semester<br>ii) In the second semester of B. Voc. I, there will be internal practical examination at the end of semester<br>iii) In the 4 <sup>th</sup> and 6 <sup>th</sup> semester of B. Voc. there will be external practical examination at the end of semester |
| <b>MEDIUM OF INSTRUCTION</b>   | : English/ Marathi.   |
| <b>STRUCTURE OF COURSE</b>     | : B. Voc. Part – I, II and III.<br>Two Semester Per Year, Two General Papers per year / semester Three Vocational Papers per Year / Semester Three Practical papers per Year / Semester.  |

## **SCHEME OF EXAMINATION :**

### **A) THEORY-**

- The theory examination shall be at the end of the each semester.
- All the general theory papers shall carry 40marks and all vocational theory papers shall carry 50marks.
- Evaluation of the performance of the students in theory shall be on the basis of semester examination as mentioned above.
- Question paper will be set in the view of entire syllabus preferably covering each unit of the syllabus.

### **• Nature of question paper for Theory examination (Excluding Business Communication Paper)**

- i) There will be seven questions carrying equal marks.
- ii) Students will have to solve any five questions

Que. No. 1 : Short answer type question with internal choice (Two out of Three)

Que. No. 2 to Que. No. 6: Long answer type questions.

Que. No. 7 : Short Notes with internal choice (Two out of Three)

### **B) PRACTICALS :**

Evaluation of the performance of the students in practical shall be on the basis of semester examination. Internal assessment at the end of Semester I, II and III and V and external examination at the end of Semester IV and VI as mentioned separately in each paper

### **Standard of Passing:**

As per the guidelines and rules for B. Voc. (Attached Separately – Annexure I)

### **Eligibility Criteria:**

1. The Eligibility for admission is 10+2 or equivalent, in any stream (Arts/Commerce/Science) from any recognized board or University.
  2. The candidates after with 10+2 year ITI course/ in any branch/trade also eligible for course.
  3. The candidates graduate from any faculty or engineering degree/diploma holders are also eligible.
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## Structure of the Course:

### B. Voc. –II (Advanced Diploma) Semester –III

| Sr. No. | Paper No. | Title  | Theory/<br>Practical<br>/Project | Marks<br>(Total) | Distribution of<br>Marks |           | Credits |           |
|---------|-----------|--|----------------------------------|------------------|--------------------------|-----------|---------|-----------|
|         |           |  |                                  |                  | Theory                   | Practical | Theory  | Practical |
|         | <b>A</b>  | <b>General Education Components</b>                  |                                  |                  |                          |           |         |           |
| 1       | XIX       | Fundamentals of Financial Accounting - I             | Theory/<br>Practical             | 50               | 40                       | 10        | 3       | 2         |
| 2       | XX        | Water Management in Horticultural Crops              | Theory/<br>Practical             | 50               | 40                       | 10        | 3       | 2         |
|         | <b>B</b>  | <b>Skill Development Components</b>                  |                                  |                  |                          |           |         |           |
| 3       | XXI       | Breeding of Fruit Crops                              | Theory                           | 50               | 50                       | --        | 3       | --        |
| 4       | XXII      | Olericulture   | Theory                           | 50               | 50                       | --        | 3       | --        |
| 5       | XXIII     | Plant Protection – I                                 | Theory                           | 50               | 50                       | --        | 3       | --        |
|         | <b>C</b>  | <b>Laboratory Work</b>                               |                                  |                  |                          |           |         |           |
| 6       | XXIV      | Breeding of Fruit Crops                              | Practical                        | 50               | --                       | 50        | --      | 3         |
| 7       | XXV       | Olericulture   | Practical                        | 50               | --                       | 50        | --      | 3         |
| 8       | XXVI      | Plant Protection – I                                 | Practical                        | 50               | --                       | 50        | --      | 3         |
|         | <b>D</b>  | <b>Field Work</b>                                    |                                  |                  |                          |           |         |           |
| 9       | XXVII     | Project/ Industrial Visit /Nursery visit/ Study Tour |                                  | 50               | --                       | 50        | --      | 2         |
|         | <b>E</b>  | <b>Non Credit Courses</b>                            |                                  |                  |                          |           |         |           |
|         |           | Environmental Studies                                | Theory                           | 50               | 50                       | --        | --      | --        |

General Education Components: The subject (Department/Discipline) in which a student takes admission

Skill Development Components: The subject closely related to a student's major subject

Non-Credit compulsory Courses: Six courses are of general nature and are compulsory

### B. Voc. –II (Advanced Diploma) Semester –IV

| Sr. No. | Paper No. | Title  | Theory/<br>Practical<br>/Project | Marks<br>(Total) | Distribution of Marks |           | Credits |           |
|---------|-----------|--|----------------------------------|------------------|-----------------------|-----------|---------|-----------|
|         |           |  |                                  |                  | Theory                | Practical | Theory  | Practical |
|         | <b>A</b>  | <b>General Education Components</b>                  |                                  |                  |                       |           |         |           |
| 1       | XXVIII    | Fundamentals of Financial Accounting - II            | Theory/<br>Practical             | 50               | 40                    | 10        | 3       | 2         |
| 2       | XXIX      | Soil, Water and Plant analysis                       | Theory/<br>Practical             | 50               | 40                    | 10        | 3       | 2         |
|         | <b>B</b>  | <b>Skill Development Components</b>                  |                                  |                  |                       |           |         |           |
| 3       | XXX       | Canopy Management in Fruit Crops                     | Theory                           | 50               | 50                    | --        | 3       | --        |
| 4       | XXXI      | Floriculture   | Theory                           | 50               | 50                    | --        | 3       | --        |
| 5       | XXXII     | Biodiversity and Conservation of Fruit Crops         | Theory                           | 50               | 50                    | --        | 3       | --        |
|         | <b>C</b>  | <b>Laboratory Work</b>                               |                                  |                  |                       |           |         |           |
| 6       | XXXIII    | Canopy Management in Fruit Crops                     | Practical                        | 50               | --                    | 50        | --      | 3         |
| 7       | XXXIV     | Floriculture   | Practical                        | 50               | --                    | 50        | --      | 3         |
| 8       | XXXV      | Biodiversity and Conservation of Fruit Crops         | Practical                        | 50               | --                    | 50        | --      | 3         |
|         | <b>D</b>  | <b>Field Work</b>                                    |                                  |                  |                       |           |         |           |
| 9       | XXXVI     | Project/ Industrial Visit /Nursery visit/ Study Tour |                                  | 50               | --                    | 50        | --      | 2         |
|         | <b>E</b>  | <b>Non Credit Courses</b>                            |                                  |                  |                       |           |         |           |
|         |           | Environmental Studies                                | Theory                           | 50               | 50                    | --        | --      | --        |

General Education Components: The subject (Department/Discipline) in which a student takes admission

**Skill Development Components:** The subject closely related to a student's major subject

**Non-Credit compulsory Courses:** Six courses are of general nature and are compulsory

**Scheme of Teaching: B. Voc. – Part II (Advanced Diploma) Semester – III**

| Sr. No. | Paper No. | Title  | Distribution of workload (Per Week) |           |       |
|---------|-----------|--|-------------------------------------|-----------|-------|
|         |           |  | Theory                              | Practical | Total |
| 1       | XIX       | Fundamentals of Financial Accounting - I               | 4                                   | 2         | 6     |
| 2       | XX        | Water Management in Horticultural Crops                | 4                                   | 2         | 6     |
| 3       | XXI       | Breeding of Fruit Crops                                | 4                                   | -         | 4     |
| 4       | XXII      | Olericulture   | 4                                   | -         | 4     |
| 5       | XXIII     | Plant Protection                                       | 4                                   | -         | 4     |
| 6       | XXIV      | Laboratory Work- Breeding of Fruit Crops               | -                                   | 4         | 4     |
| 7       | XXV       | Laboratory Work- Olericulture                          | -                                   | 4         | 4     |
| 8       | XXVI      | Laboratory Work- Plant Protection                      | -                                   | 4         | 4     |
| 9       | XXVII     | Project/ Industrial Visit/ Nursery Visit / Study Tour. | -                                   | -         | -     |
|         |           | Environmental Studies                                  | -                                   | -         | -     |
|         |           |  | 20                                  | 16        | 36    |

**Scheme of Teaching: B. Voc. – Part II (Advanced Diploma) Semester – IV**

| Sr. No. | Paper No. | Title  | Distribution of workload (Per Week) |           |       |
|---------|-----------|--|-------------------------------------|-----------|-------|
|         |           |  | Theory                              | Practical | Total |
| 1       | XXVIII    | Fundamentals of Financial Accounting - II    | 4                                   | 2         | 6     |
| 2       | XXIX      | Soil, Water and Plant analysis               | 4                                   | 2         | 6     |
| 3       | XXX       | Canopy Management in Fruit Crops             | 4                                   | -         | 4     |
| 4       | XXXI      | Floriculture                                 | 4                                   | -         | 4     |
| 5       | XXXII     | Biodiversity and Conservation of Fruit Crops | 4                                   | -         | 4     |
| 6       | XXXIII    | Laboratory Work- Canopy Management in Fruit  | -                                   | 4         | 4     |

|   |       |   |    |    |    |
|---|-------|---|----|----|----|
|   |       | Crops   |    |    |    |
| 7 | XXXIV | Laboratory Work- Floriculture                                 | -  | 4  | 4  |
| 8 | XXXV  | Laboratory Work- Biodiversity and Conservation of Fruit Crops | -  | 4  | 4  |
| 9 | XXXVI | Project/ Industrial Visit/ Nursery Visit / Study Tour.        | -  | -  | -  |
|   |       | Environmental Studies   | -  | -  | -  |
|   |       |   | 20 | 16 | 36 |

**Eligibility for Admission** : 10 + 2 from any faculty or equivalent Diploma /Advanced Diploma in any related stream

**Eligibility for Faculty** : M.Sc./M.B.A.(Agri., Horticulture, Agri. Economics, Agri Business Management, Plant Pathology, Agri. Engineering, Agri. Extension)with NET / SET/Ph.D. M. A (English) with NET/SET for Business Communication

**Eligibility for Laboratory Assistant:** B.Sc.(Agri.)/ Diploma in Agriculture

**Staffing Pattern** : In 1<sup>st</sup>Year of B. Voc. - 1 Full Time and 1 Part Time Lecturer and 1 CHB Lecturer for Business Communication

**Laboratory Assistant** : For 1<sup>st</sup>Year of B. Voc. - 1 Part-time

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**SHIVAJI UNIVERSITY, KOLHAPUR**

**B. Voc. Part – II, Semester – III**

**Horticulture and Floriculture**

**Paper – XIX : Fundamentals of Financial Accounting - I**

**Distribution of Workload:**

Theory : 04 lectures per week

Practical : 02 lectures per week per batch

Total Marks: 50 Marks (Theory 40 + Practical 10)

**Objective :** To impart basic accounting knowledge as applicable to business.

**Unit –I: Introduction to Accounting**

Meaning, Nature and Advantages of Accounting, Branches of Accounting, Accounting Concepts and Conventions, Types of Accounts, Rules of journalizing, Source Documents – Cash Voucher, Petty Cash Voucher, Cash Memo – Receipts, Debit Notes, Credit Note, Paying Slips, Withdrawals, Cheque

**Unit- II: Journal and Ledger**

Preparation of Journal entries and Ledger accounts – Subsidiary Books - Purchase Book, Purchase Return Book, Sales Book, Sales Return Book, Cash Book, Bills Receivable Book, Bills Payable Book, Journal Proper

**Unit- III: Depreciation**

Meaning, Methods – Straight Line Method – Reducing Balance Method, Change in Depreciation Method.

**Unit - IV: Final Accounts**

Preparation of Trial Balance, Preparation of Final Accounts of Sole Traders and partnership firms

**Practical: Based on the theory units:**

Marks: 10

- 1) Preparation of Journal entries and Ledger accounts
- 2) Preparation of subsidiary books
- 3) Preparation of Trial Balance
- 4) Practical problems on Final Accounts of sole traders and partnership firms
- 5) Practical problems on methods of depreciation

**Scheme of Internal Practical Evaluation**

**10 Marks**

- 1) Submission of Record Book

5 Marks

- 2) Viva – Voce

5 Marks

**Reference Books:**

- 1) Advanced Accountancy – M.C. Shukla and T.S. Garewal.
- 2) Advanced Accountancy – S.C. Jain and K. L. Narang
- 3) Advanced Accountancy – S.M. Shukla.
- 4) Advanced Accountancy – S. N. Maheshwari.
- 5) Advanced Accountancy – R. L. Gupta.

**SHIVAJI UNIVERSITY, KOLHAPUR**

**B. Voc. Part – II, Semester – III  
Horticulture and Floriculture**

**Paper – XX : Water Management in Horticultural Crops**

**Distribution of Workload:**

|           |                                  |
|-----------|----------------------------------|
| Theory    | : 04 lectures per week           |
| Practical | : 02 lectures per week per batch |

Total Marks: 50 Marks (Theory 40 + Practical 10)

**Objectives:**

- To study the water requirement of horticultural crops.
- To understand the methods of irrigation.

**Unit –I: Water resources**

Global water scenario, Hydrological cycle and Indian water Budget. Importance of water, water resources in India. Area of different crops under irrigation.

**Unit –II: Water Budget**

Function of water for plant growth, effect of moisture stress on crop growth. Available and unavailable soil moisture – distribution of soil moisture – water budgeting – kinds of water-rooting characteristics – moisture extraction pattern. Water requirement of horticultural crops

**Unit –III: Lysimeter studies**

Plant water potential-Consumptive use of pan evaporimeter-definition of evaporation, transpiration, Evapo-transpiration and potential evapotranspiration Pan evaporimeter Factor for crop growth stages – critical stages of crop growth for irrigation. Irrigation scheduling – different approaches.

**Unit –IV: Methods of Irrigation**

Methods of Irrigation- Classification, border, check basin, Square and ring basin, Furrow irrigation methods. Sub-surface pressurized methods Sprinkler- definition, adoptability, limitations, Components and types of Sprinkle irrigation system, fertilizer applicator. Drip Irrigation System- Definition, advantages, disadvantages, components, fertilizer applicator, Layout

**Reference Books:**

- 1 R.K. Shivanappan Drip Irrigation Keerthi Publishing House Pvt. Ltd., 126-Sarojini Street, Ramnagar, Coimbatore-461009
- 2 A.M. Michael Irrigation Theory and Practice-Reprint-2002 Vikas Publishing House Pvt. Ltd. New Delhi-110007

3 A.M. Michael and T.P. Ojha Principles of Agricultural Engineering Vol-II, Third Edition  
1999 Jain Brothers, Karol Bagh, New Delhi

4 Y P Rao and S. R. Bhakar Irrigation Technology Theory & Practices 2008 AgroTech  
Publishing Academy, Udaipur

5 D. Lenka Irrigation and Drainage 2001 Kalyani Publishing, Ludhiana

**Water Management in Horticultural Crops**  
**(Practical)**

**Marks:** 10

**Objectives:**

- To study the different components of advanced irrigation methods..

1. Study of Weirs, Notches, Parshall flume and orifices.
2. Numericals on Weirs, Notches, Parshall flume and orifices.
3. Study of different components of drip irrigation system.
4. Study of different components of Spinkler irrigation system.
5. Study of fertilizer application system.
6. Study of different types of filters.
7. Study of acid treatment and chlorination treatment to avoid clogging in microirrigation system.
8. Field evaluation of drip and micro-sprinkler irrigation system.
9. Estimation of irrigation efficiency of horticultural crops.
10. Study of Soil Moisture Conservation Practices.
11. Visit to Drip and sprinkler Irrigation Installation.

**Scheme of Internal Practical Evaluation**

**10 marks**

- 1) Submission of Record book
- 2) Viva–Voce

5marks  
5marks

**Reference Books:**

- 1 J.N. Luthin Drainage Engineering 1978 Wiley
- 2 Richey et al Agricultural Engineer's Handbook 1961 Tata McGraw-Hill Publishing Company Ltd, New York
- 3 S. K. Garg Hydrology and Water Resource Engineering Khanna Publications, New Delhi

**SHIVAJI UNIVERSITY, KOLHAPUR**

**B. Voc. Part – II, Semester -III**

**Horticulture and Floriculture**

**Paper - XXI: Breeding of Fruit Crops**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week.

Total Marks: 50 Marks.

**Objectives:**

- To impart comprehensive knowledge about the principles and practices of breeding of fruit crops.

**Unit – I: Mango, Banana and Pineapple**

Origin and distribution, taxonomical status - species and cultivars, cytogenetics, genetic resources, blossom biology, breeding systems, breeding objectives, ideotypes, approaches for crop improvement - introduction, selection, hybridization, mutation breeding, polyploidy breeding, rootstock breeding, improvement of quality traits, resistance breeding for biotic and abiotic stresses, biotechnological interventions, achievements and future thrust

**Unit - II: Citrus, Grapes, Guava and Sapota**

Origin and distribution, taxonomical status - species and cultivars, cytogenetics, genetic resources, blossom biology, breeding systems, breeding objectives, ideotypes, approaches for crop improvement - introduction, selection, hybridization, mutation breeding, polyploidy breeding, rootstock breeding, improvement of quality traits, resistance breeding for biotic and abiotic stresses, biotechnological interventions, achievements and future thrust

**Unit -III: Jackfruit, Papaya, Custard Apple, Aonla, Avocado and Ber**

Origin and distribution, taxonomical status - species and cultivars, cytogenetics, genetic resources, blossom biology, breeding systems, breeding objectives, ideotypes, approaches for crop improvement - introduction, selection, hybridization, mutation breeding, polyploidy breeding, rootstock breeding, improvement of quality traits, resistance breeding for biotic and abiotic stresses, biotechnological interventions, achievements and future thrust

**Unit -IV: Apple, Pear, Plums, Peach, Apricot, Cherries and Strawberry**

Origin and distribution, taxonomical status - species and cultivars, cytogenetics, genetic resources, blossom biology, breeding systems, breeding objectives, ideotypes, approaches for crop improvement - introduction, selection, hybridization, mutation breeding, polyploidy

breeding, rootstock breeding, improvement of quality traits, resistance breeding for biotic and abiotic stresses, biotechnological interventions, achievements and future thrust

### **Reference Books:**

1. ICAR. (2010). *Handbook of Agriculture* (6th edition), Indian Council of Agricultural Research, New Delhi.
2. Panda, S.C. (2012). *Modern Concepts and Advance Principles in Crop Production*. Agrobios (India), Jodhpur
3. Balasubramaniyan, P. and Palaniappan, S.P.(2016). *Principles and Practices of Agronomy*(2nd edition), Agrobios (India), Jodhpur
4. Reddy, T.Yellamanda and Reddy, G.H. Sankara. (2016). *Principles of Agronomy* (2nd edition) ,Kalyani Publishers, Ludhiana
5. Reddy, S.R. (2012). *Principles of Crop Production* (4th edition), Kalyani Publishers, Ludhiana.
6. Tomar, Gajendra Singh. (2010). *Agronomy Basics and Applied*. Satish Serial Publishing House, Azadpur, New Delhi.

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester -III**  
**Horticulture and Floriculture**

**Paper-XXII: Olericulture**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week.

Total Marks: 50 Marks.

**Objectives:**

- To acquire knowledge of various vegetable and fruit crops.
- To study the concept of kitchen gardening.

**Unit - I: Importance of Vegetables**

Economic Importance of Vegetables, Nutritional Importance of Vegetables, Importance of Vegetables in human diet.

**Unit -II: Kitchen Gardening**

Meaning of kitchen gardening, Benefits and maintenance of kitchen gardening, kitchen gardening cultivation practices: Leafy vegetable (Palak, Fenugreek, coriander)

**Unit -III: Study of Fruit Vegetables**

Cultivation, Soil and Climate, Seeds and Sowing, Irrigation and Water Management, Major pest and diseases, Harvesting of Tomato, Brinjal, Chilli, Cucumber, Okra.

**Unit – IV : Study of Important Cole Crops, Bulb and Root Crops**

Cultivation, Soil and Climate, Seeds and Sowing, Irrigation and Water Management, Major pest and diseases, Harvesting of Cabbage, Onion, Carrot,

**Reference Books:**

1. Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
2. Hartmann, HT. and Kester, DE. 1986. *Plant propagation – Principles and practices*. Prentice- Hall, New Delhi.
3. Chadha, K. L. 2003. *Handbook of Horticulture*, ICAR, New Delhi.



**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester -III**  
**Horticulture and Floriculture**

**Paper-XXIII : Plant Protection**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week.

Total Marks: 50 Marks.

**Objective:**

- To acquire knowledge of insect pest of vegetable and fruit crops.
- To study the diseases and their management of fruit crops.
- To study the methods of disease control.

**Unit - I: Study of Insects Pest of Vegetable Crops**

Introduction, Nature of damage, symptoms, and control majors of pest in Tomato, Brinjal, Chilli, Okra, Cucumber, Cabbage

**Unit - II: Study of Insects Pest of Fruit Crops**

Introduction, Nature of damage, symptoms, and control majors of pest in Mango, Pomegranate, Citrus Crops, Ber, Grapes.

**Unit - III: Diseases of Major Fruit Crops**

Introduction, Nature of damage, symptoms, and control majors of diseases in Mango, Pomegranate, Citrus Crops, Ber, Grapes.

**Unit - IV: Methods of Disease Control**

Management methods of diseases, Chemical Formulation, Methods of application of fungicide.

**Reference Books:**

1. Mani, M. S. 1968. General Entomology. Oxford and IBH Publishing Company, New Delhi.
2. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
3. Dhaliwal, G. S. and Ramesh Arora. 1998. Principles of Insect Pest Management. Kalyani Publishers, New Delhi.
4. Principles of Plant Pathology – R.S. Singh.

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – I, Semester -I**  
**Horticulture and Floriculture**

**Paper-XXIV : Laboratory work - Breeding of Fruit Crops (Practical)**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

**Objectives:**

- To analysis, learn & study importance and practices of breeding of fruit crops

**Practicals:**

1. Characterization of germplasm, blossom biology.
2. Study of anthesis, estimating fertility status.
3. Practices in hybridization, ploidy breeding, mutation breeding.
4. Evaluation of biometrical traits and quality traits, screening for resistance.
5. Developing breeding programme for specific traits.
6. Visit to research stations working on tropical, subtropical and temperate fruit improvement.

**Scheme of practical evaluation**

|  |                |
|--|----------------|
| <b>Internal practical evaluation</b>   | <b>50marks</b> |
| i) Submission of practical record book | 20marks        |
| ii) Submission of visit report         | 15marks        |
| iii) Viva–Voce                         | 15marks        |

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**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester -III**  
**Horticulture and Floriculture**

**Paper-XXV: Laboratory work - Olericulture (Practical)**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

**Practicals:**

Identification of seed and plants of vegetables crops

Preparation of raised beds and raising of seedlings of vegetables

Study of morphological characteristics of different vegetable crops

Harvesting and preparation of vegetables for market

Seed treatment to vegetable seeds.

**Scheme of practical evaluation**

**Internal practical evaluation**

i) Submission of practical record book

ii) Submission of visit report

iii) Viva–Voce

**50marks**

20marks

15marks

15marks

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**SHIVAJI UNIVERSITY, KOLHAPUR**

**B. Voc. Part – II, Semester -III**

**Horticulture and Floriculture**

**Paper-XXVI: Laboratory work - Plant Protection (Practical)**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

**Objectives:**

- To build the knowledge about the importance and production technology of cut flowers.

**Practical**

Identification of different insect pests of crops given in theory

Study of nature of damage and control measure of vegetable crops pests given in theory

Study of nature of damage and control measure of fruit crops pests given in theory

Study of symptoms and control measure of fruit crops diseases given in theory

Study of preparation of Bordeaux mixture

**Scheme of practical evaluation**

**Internal practical evaluation**

- i) Submission of practical record book
- ii) Submission of visit report
- iii) Viva–Voce

**50marks**

20marks

15marks

15marks

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**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester -III**  
**Horticulture and Floriculture**

**Paper-XXVII: Project/ Field Visit/ Crop Museum/ Nursery Visit/ Agriculture Mall Visit**

Total Marks: 50 Marks.

Some specimen of modified crop varieties should be collected and data of the relevant species including cultivation and harvesting techniques are to collected and displayed with proper scientific preservation and knowledge. This work should be completed within a span of year.

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**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester – IV**  
**Horticulture and Floriculture**

**Paper – XXVIII : Fundamentals of Financial Accounting - II**

**Total Workload:** 06 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week  
Practical: 02 lectures per week per batch

Total Marks: 50 Marks (Theory 40 + Practical 10)

**Objectives:** To impart basic accounting knowledge as applicable to business

**Unit –I: Computerized Accounting System**

Introduction – Concept – Components –Features - Importance and Utilization of Computerized Accounting System.

**Unit –II: Computer Application through Accounting Package Tally**

Creation of Company, Group, Ledger Accounts, Feeding of Accounting Data Receipts, Payments, Purchase, Sale, Contra, Journal, Credit Note and Debit Note Inventory Information – Groups, Items and Valuation Generation of various Accounting Reports

**Unit –III: Accounts of Professionals**

Preparation of Receipts and Payment Account – Income and Expenditure Account and Balance Sheets of Non Profit Organization

**Unit –IV: Single Entry System**

Conversion of Single Entry System into Double Entry System

**Practical: Based on the theory units:**

Marks: 10

1. Understanding computerized accounting practices applied in different retail malls in and around Kolhapur city
  2. Practical problems based on computerized accounting using Tally
  3. Practical problems on preparation of Receipts and Payment Account
  4. Preparation of Income and Expenditure account and Balance Sheet of Non-profit making organizations
  - Solving the problems on conversion of Single Entry system into Double entry system. 6.
- Oral / Seminar

**Reference Books:**

- 1) Advanced Accountancy, M. C. Shukla and T. S. Garewal.
- 2) Advanced Accountancy, S.C. Jain and K. L. Narang.
- 3) Advanced Accountancy, S.N. Maheshwari.
- 4) Theory and practice of Computer Accounting, Rajan Chougule and Dhaval Chougule.

Web sites:

1) [www.nos.org](http://www.nos.org) 2) [www.wiki.answers.com](http://www.wiki.answers.com) 3) [Chow.com](http://Chow.com).

**Scheme of External Practical Examination**

**10 marks**

1) Submission of Record book

5 marks

2) Viva – Voce

5 marks

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester – IV**  
**Horticulture and Floriculture**

**Paper – XXIX : Soil, Water and Plant analysis**

**Total Workload:** 06 lectures per week

**Distribution of Workload:**

|            |                                |
|------------|--------------------------------|
| Theory:    | 04 lectures per week           |
| Practical: | 02 lectures per week per batch |

Total Marks: 50 Marks (Theory 40 + Practical 10)

**Objectives:**

- To understand information regarding importance & uses of soil, water and plant analysis.

**Unit –I: Importance and methods of analysis**

Importance and objectives of soil, water and plant analysis Principles of instrumentation in soil, water and plant analysis. Methods of soil, water and plant sampling and processing for Analysis. Nutrient mobility, diffusion and mass flow Renewal of gases in soil and their abundance

**Unit –II: Principles and methods of measurement of oxygen diffusion rate**

Principles and methods of measurement of oxygen diffusion rate and redox potential. Radio tracer technology application in plant nutrient studies and fertility evaluation. Soil micro-organisms and their importance.

**Unit –III: Soil Management**

Saline and alkali appraisal and management. Acid soil appraisal and management. Waterlogged soil appraisal and management. Sandy soil appraisal and management.

**Unit –IV: Irrigation Water Management**

Chemical and mineral composition of horticultural crops. Leaf analysis standards, index tissue, interpretation of leaf analysis values quality of irrigation water. Rapid tissue test for plant. Management of poor quality irrigation water in crop management Soil pollution and water pollution.

**Reference Books:**

1. H.L.S. Tandon. 2013, Methods of analysis of soil, plant, water and fertilizers. FDCO, New Delhi.
2. Yawalkar, K.S. Agarwal, Pand Bokde., 1977 Manures and fertilizers. Agri-Horticultural Publishing House, Nagpur.
3. Sehgal J.A. 2005. Textbook of Pedology Concepts and Applications. Kalyani Publishers, New Delhi.
4. Jaiswal, P.C., 2006. Soil, Plant and Water Analysis (2nd Edition), Kalyani Publishers, Ludhiana.
5. Jackson M.L, 1967. Soil Chemical Analysis, Oxford and IBH Publishing Co., New Delhi.
6. P.K. Gupta., 2013, Soil, Plant, water and fertilizer analysis. Agrobios, India.



7. M. V. Durai., 2014, Hand book of Soil, plant, water, fertilizers and Manure analysis. New India Publishing Agency.

**Soil, Water and Plant analysis (Practical)**

**Marks: 10**

**Practicals:**

1. Collection and preparation of soil, water and plant samples for analysis.
2. Determination of pH and EC of soil.
3. Estimation of moisture content in soils and plants.
4. Determination of available NPK in soil.
5. Determination of Carbonates , bicarbonates sulphates and chlorides in irrigation water.
6. Determination of NPK calcium , magnesium and sulphur in plant sample.
7. Preparation of plant nutrient deficiency symptoms album.

**Scheme of Internal Practical Evaluation**

**10 marks**

- 1) Submission of Record book
- 2) Viva–Voce

5marks  
5marks

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester – IV**  
**Horticulture and Floriculture**

**Paper – XXX: Canopy Management in Fruit Crops**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week.

Total Marks: 50 Marks.

**Objectives:**

- To impart knowledge about the principles and practices in canopy management of fruit crops.

**Unit –I: Canopy Management**

Canopy management - importance and advantages; factors affecting canopy development.

**Unit –II: Canopy Types**

Canopy types and structures with special emphasis on geometry of planting, canopy manipulation for optimum utilization of light. Light interception and distribution in different types of tree canopies.

**Unit –III: Spacing and utilization of land area**

Spacing and utilization of land area - Canopy classification; Canopy management through rootstock and scion.

**Unit –IV: Canopy development and management**

Canopy management through plant growth inhibitors, training and pruning and management practices. Canopy development and management in relation to growth, flowering, fruiting and fruit quality in temperate fruits, grapes, passion fruits, mango, sapota, guava, citrus and ber.

**Reference Books:**

1. Chadha, K.L. & Shikhamany, S.D. 1999. The Grape, Improvement, Production and Post Harvest Management. Malhotra Publ. House.
2. Pradeep kumar T., Suma, B., Jyothibhaskar & Satheesan, K.N. 2008. Management of Horticultural Crops. New India Publ. Agency.

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester – VI**  
**Horticulture and Floriculture**

**Paper – XXXI: Floriculture**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week.

Total Marks: 50 Marks.

**Objectives:**

- To study the production technology of various flower crops.
- To acquire the knowledge about grading and packaging flowers.
- To study the production technology of medicinal crops

**Unit –I: Scope and Importance**

Introduction, Classification, scope and Importance: Ornamental Plants, Medicinal Plants and Aromatic Plants.

**Unit –II: Production Techniques of Important Cut Flowers**

Plantation Techniques, pest and diseases and their management and production of : Rose, Gerbera, Marigold, Carnation.

**Unit –III: Grading and Packaging**

Process of grading, Types of packaging and packaging materials, Commercial uses of : Loose flowers like Marigold and Jasmine.

**Unit –IV: Production Technology of Medicinal Plants**

Introduction, Plantation, Harvesting and uses of Ashwagandha, aloe, neem and turmeric.

**Reference Books:**

1. Denixon, RI. 1979. Principles of Horticulture. Mac Millan, New York.
2. Hartmann, HT. and Kester, DE. 1986. Plant propagation – Principles and practices. Prentice-Hall, New Delhi.
3. Chadha, K. L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhury, B. 1983. Vegetables. National Book Trust, New Delhi.
4. Bose, TK., Mitra, SK. and Sadhu, K. 1986. Propagation of tropical and Sub tropical horticultural crops. Naya Prokash, Calcutta

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester – VI**  
**Horticulture and Floriculture**

**Paper – XXXII : Biodiversity and Conservation of Fruit Crops**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Theory: 04 lectures per week.

Total Marks: 50 Marks.

**Objectives:**

- Understanding the principles of biodiversity and strategies in germplasm conservation of fruit crops.

**Unit –I: Biodiversity and conservation**

Biodiversity and conservation; issues and goals, centers of origin of cultivated fruits; primary and secondary centers of genetic diversity.

**Unit –II: Present status of gene centers**

Present status of gene centers; exploration and collection of germplasm; conservation of genetic resources – conservation in situ and ex situ.

**Unit –III: Germplasm conservation**

Germplasm conservation- problem of recalcitrancy - cold storage of scions, tissue culture, cryopreservation, pollen and seed storage; inventory of germplasm, introduction of germplasm, plant quarantine.

**Unit –IV: Government Regulations**

Intellectual property rights, regulatory horticulture. Detection of genetic constitution of germplasm and maintenance of core group. GIS and documentation of local biodiversity, Geographical indication

**Reference Books:**

1. Frankel, O.H. & Hawkes, J.G. 1975. Crop Genetic Resources for Today and Tomorrow. Cambridge University Press.
2. Peter, K.V. & Abraham, Z. 2007. Biodiversity in Horticultural Crops. Vol. I. Daya Publ. House.
3. Peter, K.V. 2008. Biodiversity of Horticultural Crops. Vol. II. Daya Publ. House.

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part –II, Semester -IV**  
**Horticulture and Floriculture**

**Paper-XXXIII: Laboratory Work- Canopy Management in Fruit Crops**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

**Practicals:**

1. Study of different types of canopies.
2. Study of training of plants for different canopy types.
3. Canopy development through pruning.
4. Use of plant growth inhibitors, geometry of planting.
5. Study on effect of different canopy types on production and quality of fruits..

**Scheme of practical evaluation**

|  |                |
|--|----------------|
| <b>Internal practical evaluation</b>   | <b>50marks</b> |
| i) Submission of practical record book | 20marks        |
| ii) Submission of visit report         | 15marks        |
| iii) Viva–Voce                         | 15marks        |

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**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester -IV**  
**Horticulture and Floriculture**

**Paper-XXXIV: Laboratory Work- Floriculture**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

**Practicals:**

Identification of ornamental and aromatic plants

Identification of medicinal Plants

Identification of different flowering plants

Planning and layout of garden

Harvesting and postharvest handling of cut and loose flowers

Visit to commercial flower garden

**Scheme of practical evaluation**

**Internal practical evaluation**

**50marks**

i) Submission of practical record book

20marks

ii) Submission of visit report

15marks

iii) Viva–Voce

15marks

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**SHIVAJI UNIVERSITY, KOLHAPUR**

**B. Voc. Part – II, Semester -VI**

**Horticulture and Floriculture**

**Paper-XXXV: Laboratory Work- Biodiversity and Conservation of Fruit Crops**

**Total Workload:** 04 lectures per week

**Distribution of Workload:**

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

**Practicals:**

1. Documentation of germplasm – maintenance of passport data and other records of accessions
2. Field exploration trips, exercise on ex situ
3. Conservation – cold storage, pollen/seed storage, cryopreservation.
4. Visits to National Gene Bank and other centers of PGR activities
5. Detection of genetic constitution of germplasm, core sampling
6. Germplasm characterization using molecular techniques.

**Scheme of practical evaluation**

**Internal practical evaluation**

**50marks**

i) Submission of practical record book

20marks

ii) Submission of visit report

15marks

iii) Viva–Voce

15marks

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**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – II, Semester -VI**  
**Horticulture and Floriculture**

**Paper-XXXVI: Project/ Field Visit/ Crop Museum/ Nursery Visit/ Agriculture Mall Visit**  
Total Marks: 50 Marks.

- Soil testing lab project, Green houses, Polythene house, Drip irrigation installation.
- Some specimen of modified crop varieties should be collected and data of the relevant species including cultivation and harvesting techniques are to collected and displayed with proper scientific preservation and knowledge. This work should be completed within a span of year.

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