

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 I- Sem. I & II**

Syllabus to be implemented from

(Subject to the modifications that will be made from time to time)
Syllabus to be implemented from June, 2020 onwards.

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

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

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	General Education Components						
1	I	Business Communication- I	Theory/ Practical	50	40	10	3	2
2	II	Fundamental of Soil Science	Theory/ Practical	50	40	10	3	2
	B	Skill Development Components						
3	III	Fundamentals of Agronomy	Theory	50	50	--	3	--
4	IV	Fundamentals of Horticulture	Theory	50	50	--	3	--
5	V	Production Technology of Cut Flowers	Theory	50	50	--	3	--
	C	Laboratory Work						
6	VI	Fundamentals of Agronomy	Practical	50	--	50	--	3
7	VII	Fundamentals of Horticulture	Practical	50	--	50	--	3
8	VIII	Production Technology of Cut Flowers	Practical	50	--	50	--	3
	D	Field Work						
9	IX	Project/ Industrial Visit /Nursery visit/ Study Tour		50	--	50	--	2
	E	Non Credit Courses						

		Democracy, Elections and Good Governance	Theory	50	50	--	--	--
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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. –I (Diploma) Semester –II

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	General Education Components						
1	X	Business Communication-II	Theory/ Practical	50	40	10	3	2
2	XI	Fertilizer & Pesticide : Sustainable approaches	Theory/ Practical	50	40	10	3	2
	B	Skill Development Components						
3	XII	Principles of Genetics and Cytogenetics	Theory	50	50	--	3	--
4	XIII	Growth and Development of Horticultural Crops	Theory	50	50	--	3	--
5	XIV	Nursery Management	Theory	50	50	--	3	--
	C	Laboratory Work						
6	XV	Principles of Genetics and Cytogenetics	Practical	50	--	50	--	3
7	XVI	Growth and Development of Horticultural Crops	Practical	50	--	50	--	3
8	XVII	Nursery Management	Practical	50	--	50	--	3
	D	Field Work						
9	IX	Project/ Industrial Visit /Nursery visit/ Study Tour		50	--	50	--	2
	E	Non Credit Courses						
		Democracy, Elections and Good Governance	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 I (Diploma) Semester – I

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	I	Business Communication- I	4	2	6
2	II	Fundamental of Soil Science	4	2	6
3	III	Fundamentals of Agronomy	4	-	4
4	IV	Fundamentals of Horticulture	4	-	4
5	V	Production Technology of Cut Flowers	4	-	4
6	VI	Laboratory Work- Fundamentals of Agronomy	-	4	4
7	VII	Laboratory Work- Fundamentals of Horticulture	-	4	4
8	VIII	Laboratory Work- Production Technology of Cut Flowers	-	4	4
9	IX	Project/ Industrial Visit/ Nursery Visit / Study Tour.	-	-	-
		Democracy, Elections and Good Governance	-	-	-
			20	16	36

Scheme of Teaching: B. Voc. – Part I (Diploma) Semester – II

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	X	Business Communication- II	4	2	6
2	XI	Fertilizer & Pesticide : Sustainable approaches	4	2	6
3	XII	Principles of Genetics and Cytogenetics	4	-	4
4	XIII	Growth and Development of Horticultural Crops	4	-	4
5	XIV	Nursery Management	4	-	4
6	XV	Laboratory Work- Principles of Genetics and	-	4	4

		Cytogenetics			
7	XVI	Laboratory Work- Growth and Development of Horticultural Crops	-	4	4
8	XVII	Laboratory Work-Nursery Management	-	4	4
9	XVIII	Project/ Industrial Visit/ Nursery Visit / Study Tour.	-	-	-
		Democracy, Elections and Good Governance	-	-	-
			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 1stYear of B. Voc. - 1 Full Time and 1 Part Time Lecturer and 1 CHB Lecturer for Business Communication

Laboratory Assistant : For 1stYear of B. Voc. - 1 Part-time

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

Paper – I: Business Communication-I

Distribution of Workload:

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

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

Unit –I: Use of English in Business Environment.

Business Vocabulary: Vocabulary for banking, marketing and for maintaining Public relations.

What is a sentence? Elements of a sentence.

Types of sentence: Simple, compound, complex

Unit- II: Writing a Letter of Application and CV/Resume

Structure of a letter of application for various posts CV/Resume and its essentials

Unit- III: Presenting Information / Data.

Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flowcharts

Unit - IV: Interview Technique

Dos and don'ts of an interview preparing for an interview Presenting documents

Language used in an interview

Practical: Based on the theory units:

Marks: 10

Reference Books:

- Sethi, Anjane & Bhavana Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill
- Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publi. 2003

Pattern of a Question paper
Business Communication –I
Semester –I paper-I

Time : 2 hours	Total Marks:40
Q.1 Do as directed questions items on unit 1 to be asked	10 (10out of 12)
Q.2 Write a letter of application	10
OR	
Draft a CV / Resume for a particular post	10
Q.3 Present a given information or a data using a table/ chart/piedigaram,etc. (any one diagram to be drawn)	10
Q.4 Fill in the blanks in the given interview	10
Practical Evaluation:	
Oral and presentation based on units prescribed	10 Marks

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

Paper – II: Fundamental of Soil Science

Distribution of Workload:

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

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

Objectives:

- To study the fundamentals of soil and various types, classification of soils.
- To understand the formation of soil

Unit –I: Soil Science: Introduction

Soil Science: Introduction, soil forming factors, parent material, characteristics of soil, Classification, Organic matter and humus.

Minerals: Definition, and classification mineral composition of rocks, physical properties of minerals chemical properties, silicate class, carbonate class, sulphide, phosphate, element class, organic halide oxide class.

Unit –II: Soil Colour and Structure

Soil colour-definition, significance, Munsell soil colour chart.

Factors influencing soil colour- parent material, soil moisture and organic matter

Soil structure: definition, classification, clay prism like structure, and Genesis.

Factors influencing soil structure.

Soil consistence, plasticity, Atterberg's limits

Unit –III: Soil fertility

Soil fertility: soil fertilization light and CO₂ limitation, soil depletion, humus and humification. Benefits of soil organic matter, and humus, Biomass, sources chemical, Biochemical conversion Environmental impact

Unit –IV: Soil P^H

Soil pH: Importance, Nutrient availability in relation to soil P^H, factors affecting soil P^H, soil life and soil P^H and plant diseases, quick lime and slaked lime, reducing soil P^H, example and plant books.

Soil conversion: Erosion prevention salinity management soil micro-organisms mineralization.

Reference Books:

1. Boul S.W., Hole R.D., McCracken and Southard R.J. (1998). *Soil Genesis and Classification* Fourth Ed Panima Publishing Corporation, New Delhi.
2. .Baver, L.D. Gardener, W.H. and gardener W.R.(1976) *Soil Physics* Wiley Eastern Ltd, New Delhi
3. Biswas, T.D. and Mukherjee, S.K. (2006) *Text book of soil science*. Tata McGraw Hill Publishing Co. Ltd, New Delhi
4. Brady, N.C. and Weil, R.R. (2016) *The Nature and Properties of Soils*, 15th edition Publisher Prentice Hall of India Pvt. Ltd, M-97, Connaught Circus, New Delhi
5. Das, D.K. (2011) *Introductory Soil Science*, 3rd revised and Enlarged Ed, Kalyani Publisher, Ludhiana
6. Mehra R.K. (2004) *Text book of Soil Science*, ICAR, New Delhi
7. ISSS (2009) *Fundamentals of Soil Science*, Div. of Soil Science, IARI, New Delhi
8. Chopra S.L. and Kanwar, J.S. (1991) *Analytical Agricultural Chemistry*, Kalyani Publisher, Ludhiana
9. Jackson, M.L. (1973)*Soil Chemical Analysis*, Prentice Hall of India, Pvt. Ltd, New Delhi
10. Piper, C.S. (1950) *Soil and Plant Analysis*. .Hans Publications, Bombay

Fundamental of Soil Science

(Practical)

Marks: 10

Objectives:

- To study the different soil sample analysis.
1. Determination of Water holding capacity of soil.
 2. Study of soil profile in field.
 3. Study of soil sampling tools.
 4. Collection of representative soil sample, its processing and storage.
 5. Study of soil forming rocks and minerals.
 6. Determination of soil P^H and electrical conductivity.
 7. Determination of soil colour.
 8. Estimation of organic matter content of soil.

Scheme of Internal Practical Evaluation

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

10 marks

5marks

5marks

Reference Books:

1. Principle and Practices of soil science – R E White.
2. Soil science & management - Book by Edward J. Plaster.
3. Soil Minerals by Trotter Brown, Publisher: Zealand Publishing House
4. Essential Soil Science: A Clear and Concise Introduction to Soil Science
By Geeta Puri and Mark Ashman.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester -I

Horticulture and Floriculture

Paper - III: Fundamentals of Agronomy

Total Workload: 04 lectures per week

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

- To acquire knowledge of Agronomy.
- To know the importance of seed, plant nutrients and irrigation to crops.

Unit – I: Introduction to Agronomy

Agronomy and its scope. Classification of Crops on different basis. Agronomic classification of crops. Importance of Indian Agriculture. Commercial agriculture, sustainable agriculture seasons in India.

Unit - II: Crop Weed Management

Weeds- importance, classification, crop weed competition, concepts of weed management principles and methods, herbicides- classification, selectivity and resistance, allelopathy.

Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, crop management technologies in problematic areas, harvesting and threshing of crops

Unit -III: Soil and Water Conservation

Principles of Soil Erosion, Water Erosion, Wind Erosion, Soil and Water Conservation Measures.

Unit -IV: Irrigation and Water Management

Importance of water in crop production. Soil Moisture constants. Estimation of potential evapo-transpiration and consumptive use. Water requirement of crops and factors affecting it. Approaches of irrigation scheduling. Systems and methods of irrigation – drip, sprinkler and mist Irrigation. Quantity and quality of irrigation. Measurement of irrigation water. Elementary idea of drainage on farms.

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 – I, Semester -I
Horticulture and Floriculture

Paper-IV: Fundamentals of Horticulture

Total Workload: 04 lectures per week

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

- To understand vegetative propagation.
- To know the various operations carried out in field.

Unit - I: Classification of Horticulture

Horticulture- its definition and branches, Importance and scope, Selection of site for fruit growing, Horticultural and Botanical classification, Fruit Zones of Maharashtra.

Unit -II: Indian Horticulture

Indian Horticulture, various crops taken in India. Climate & Weather Requirement & there economic importance. Geographical Importance & Topographical change.

Unit -III: Pomology & Floriculture

Pomology refers to cultivation of fruits & Floriculture refers to cultivation of flowers. The method of cultivation & intercultural operations & tillage practices.

Unit – IV : Fertility Management in Horticultural Crops

Weedmanagement, fertility management in horticultural crops-manures and fertilizers, different methods of application, cropping systems, intercropping, multi-tier cropping, mulching– objectives, types merits and demerits, Classification of bearing habits of fruit trees, factors influencing the fruitfulness and unfruitfulness. Principles of organic farming

Reference Books:

1. Chadha, K.L. (ICAR), (2002). *Handbook of Horticulture*, ICAR, New Delhi
2. D.K. Salunkhe and S.S. Kadam, (2013). *A handbook of Fruit Science and Technology*. CRC Press.
3. Denisen E.L., (1957). *Principles of Horticulture*. Macmillan Publishing Co., New York.
4. Edmond, J.B, Sen, T.L, Andrews, F.S and Halfacre R.G., (1963). *Fundamentals of Horticulture*. Tata McGraw Hill Publishing Co., New Delhi.

5. Gardner/Bardford/Hooker. J.R., (1957). *Fundamentals of Fruit Production*. Mac Graw Hill Book Co., New York.
 6. Jitendra Singh, (2002). *Basic Horticulture*. Kalyani Publishers, Hyderabad.
 7. K.V.Peter, (2009). *Basics Horticulture*. New India Publishing Agency
 8. Kausal Kumar Misra and Rajesh Kumar, 2014. *Fundamentals of Horticulture*. Biotech Books.
 9. Kumar, N., (1990). *Introduction to Horticulture*. Rajyalakshmi publications, Nagarcoil, Tamil Nadu
 10. NeerajPratap Singh, (2005). *Basic concepts of Fruit Science* 1stEdn. IBDC Publishers.
 11. Prasad and Kumar, (2014). *Principles of Horticulture* 2ndEdn. Agrobios (India).
 12. S. Prasad and U. Kumar, (2010). *A handbook of Fruit Production*. Agrobios (India).
- e-reading: <http://ecourses.iasri.res.in/>**

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

Paper-V: Production Technology of Cut Flowers

Total Workload: 04 lectures per week

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objective:

- To impart basic knowledge about the importance and production technology of cut flowers grown in India.

Unit - I: Introduction to Cut Flowers

Scope of cut flowers in global trade, Global Scenario of cut flower production, Varietal wealth and diversity, area under cut flowers and production problems in India- Patent rights, nursery management, media for nursery, special nursery practices

Unit - II: Cultivation Methods

Growing environment, open cultivation, protected cultivation, soil requirements, artificial growing media, soil decontamination techniques, planting methods, influence of environmental parameters, light, temperature, moisture, humidity and CO₂ on growth and flowering.

Unit - III: Flower production

Flower production – water and nutrient management, fertigation, weed management, rationing, training and pruning, disbudding, special horticultural practices, use of growth regulators, physiological disorders and remedies, IPM and IDM, production for exhibition purposes.

Unit - IV: Harvesting Techniques

Cut flower standards and grades, harvest indices, harvesting techniques, post-harvest handling, Methods of delaying flower opening, Pre-cooling, pulsing, packing, Storage and transportation, marketing, export potential, institutional support, Agri Export Zones.

Reference Books:

1. Arora JS.,(2006). *Introductory Ornamental horticulture*. Kalyani
2. Bhattacharjee SK. (2006). *Advances in Ornamental Horticulture*. Vols. I-VI. Pointer Publication.
3. Bose TK & Yadav LP. (1989). *Commercial Flowers*. Naya Prokash.

4. Bose TK, Maiti RG, Dhua RS & Das P. (1999). *Floriculture and Landscaping*. NayaProkash.
5. Chadha KL & Chaudhury B. (1992). *Ornamental Horticulture in India*. ICAR.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester -I

Horticulture and Floriculture

Paper-VI: Laboratory work - Agronomy (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 types of soil

Practicals:

1. Soil and Water P^H calculation by using P^H paper and universal indicator/meter.
2. Layout making.
3. Seed calibration & sowing.
4. Seed germination and viabilities test.
5. Intercultural operation of various crops.
6. Types of fertilizers.

Scheme of practical evaluation

Internal practical evaluation

i) Submission of practical record book	50marks
ii) Submission of visit report	20marks
iii) Viva–Voce	15marks
	15marks

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

Paper-VII: Laboratory work -Horticulture (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 make perfect techniques for learners& study horticultural practices & cultivation methods.

Practicals:

- 1.Prepare a chart of nutritional importance of plants.
- 2.Major horticultural plants in local area.
3. Plant Pruning Techniques.
4. Vegetative propagation by Layering.
5. Vegetative propagation by Grafting and Budding.
6. Layout making.
7. Intercultural operation of various crops.
8. Study of weather and weather forecasting.

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 – I, Semester -I
Horticulture and Floriculture

Paper-VIII: Laboratory work -Production Technology of Cut Flowers (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

1. Botanical description of varieties of cut flower.
2. Propagation techniques of cut flower.
3. Mist chamber operation for cut flower growing.
4. Training and pruning techniques, practices in manuring for cut flower.
5. Drip and fertigation, foliar nutrition, growth regulator application in cut flower.
6. pinching, disbudding, staking, harvesting techniques, post-harvest handling of cut flower.
7. Cold chain, project preparation for regionally important cut flowers.
8. Visit to commercial cut flower units.

Scheme of practical evaluation

Internal practical evaluation

i) Submission of practical record book	50marks 20marks
ii) Submission of visit report	15marks
iii) Viva–Voce	15marks

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

Paper-IX: 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 – I, Semester – II
Horticulture and Floriculture

Paper – X: Business Communication-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)

Unit –I: Group Discussion

Preparing for a Group Discussion
Initiating a Discussion
Eliciting Opinions, views etc.
Expressing Agreement /Disagreement
Making Suggestions; Accepting and Declining
Suggestions
Summing up.

Unit –II: Business Correspondence

Writing Memos, e-mails, complaints, inquiries, etc.
Inviting Quotations
Placing Orders, Tenders, etc

Unit –III: English for Negotiation

Business Negotiations
Agenda for Negotiation
Stages of Negotiation

Unit –IV: English for Marketing

Describing/Explaining a Product/Service
Promotion of a Product
Dealing/ bargaining with Customers
Marketing a Product/Service: Using Pamphlets, Hoardings,
Advertisement, Public Function/Festival

Practical: Based on the theory units:

Marks: 10

Reference Books:

- Herekar, Praksh (2007). *Business Communication*. Mehta Publications, Pune.
- Herekar, Praksh (2003). *Principals of Business Communication*. Mehta Publications, Pune
- John, David. *Group Discussions*. Arihant Publications, New Delhi.
- Kumar, Varinder (2000). *Business Communication*. Kalyani Publishers, New Delhi.
- Pardeshi, P.C. (2008). *Managerial Communication*. Nirali Prakashan, Pune.
- Pradhan, N. S. (2005). *Business Communication*. Himalaya Publishing House, Mumbai.
- Rai, Urmila & S. M. Rai. (2007). *Business Communication*. Himalaya Publishing House, Mumbai
- Sethi, A. & B. Adhikari. *Business Communication*. Tata McGraw Hill. New Delhi.
- Sonie, Subhash C. (2008) *Mastering the Art of Effective Business Communication*, Student Aid Publication, New Delhi.
- Tickoo, Champa & Jaya Sasikumar (1979). *Writing with a Purpose*. OUP, New York.

· Whitehead, Jeffrey & David H. Whitehead. (1996) *Business Correspondence*. Wheeler Publishing, Allahabad.

Pattern of a Question paper
Business Communication –I
Semester –I paper-I

Time : 2 hours **Total Marks:40**

Q.1 Do as directed questions items on unit 1 to be asked 10 (10out of 12)

Q.2 Write a letter of application 10

OR

Draft a CV / Resume for a particular post 10

Q.3 Present a given information or a data using a table/ chart/piedigaram,etc. 10
(any one diagram to be drawn)

Q.4 Fill in the blanks in the given interview 10

Practical Evaluation:

Oral and presentation based on units prescribed **10 Marks**

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

Paper – XI: Fertilizer & Pesticide : Sustainable approaches

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 fertilizers & pesticides.

Unit –I:Fertilizers

Introduction, Need and types of fertilizers, uses. Basic chemistry of fertilizers. National and international status and approaches of development of fertilizers.

Unit –II:Biofertilizer

Methods of development of biofertilizers technology transfer projects for development of biofertilizers. Types of biofertilizer.

Unit –III:Pesticides

Introduction, types of pesticides status, and approaches. Biopesticides: Introduction Advantage, types of Biopesticides. Trends and opportunities: Agrochemical management and manufacturing.

Unit –IV:Trends and opportunities

Agrochemical management and manufacturing. Various agrochemical brands, classification, types & uses. Equipments used for using chemicals which includes in liquid, soil application, water soluble, powder forms.

Reference Books:

- Havlin , John L. (2004). *Soil Fertility and Fertilizers: An Introduction to Nutrient Management* Published by Prentice Hall of India, Pvt. Ltd New Delhi
- Zhongqi He and Hailin Zhang (2016). *Applied Manure and Nutrient Chemistry for Sustainable Agriculture and Environment* Paperback – Import. Springer.
- ICAR Handbook of manures and fertilizers (1971)
- Tisdale, S. L. and Nelson, W. L. and Beaton, J. D. (2010). *Soil Fertility and fertilizers*. 7th Ed. Macmillan Publishing Company, 445 Hutchinson Avenue, Columbus.
- Yawalkar, K. S. , Agarwal, J. P. and Bokde, S. (1967). *Manures and Fertilizers*. Agri-Horticultural Publishing house, Nagpur.

Fertilizers and Pesticides: sustainable organic approaches (Practical) Marks: 10

Objectives:

- To familiarize the students with biofertilizers and Biopesticides.

Practicals:

1. Studying types of Fertilizers.
2. Chemistry of fertilizers.
3. Biofertilizers: Types Development.
4. Survey of availability of pesticides in Market.
5. Biopesticides: Types of biopesticides.

Scheme of Internal Practical Evaluation

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

10 marks

5marks

5marks

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

Paper – XII: Principles of Genetics and Cytogenetics

Total Workload: 04 lectures per week

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

- To understand Genetics variation in plants.

Unit –I:History of Genetics

History of genetics, theories and hypothesis. Relation of Genetic with other fields of science, scope and Importance

Unit –II: Cell Reproduction

Ultra structure of cell, cell organelles and their functions. Study of Chromosome structure, morphology, number, types, karyotypes and ideogram. Cell reproduction, mitosis, meiosis and its significance. Gametogenesis and syngamy in plants.

Unit –III: Mendel's contribution

Mendel's contribution - Mendel's law of Segregation, monohybrid. Mendel's Laws of inheritance : Di & tri-hybrid ratio, deviation from Mendelian inheritance. pleiotropy, threshold characters, co-dominance, penetrance and expressivity. Chromosome theory of inheritance, gene interaction.

Unit –IV: Gene Interactions

Gene interactions different types with example and test cross ratio. Types of gene action, Multiple Alleles-its characteristics, pseudoalleles. Quantitative inheritance linkage and crossing over, sex linked inheritance and characters. Cytoplasmic inheritance and maternal effects. Chemical basis of heredity, structure of DNA and its replication.

Reference Books:

- Gupta, P.K. (1985). *Cytology, genetics and cytogenetics*. Rastogi Publication, India.
- Shukla. (2001). *Cell Biology* Dominant publishers, New Delhi
- Norman, V. Rothwell. *Understanding Genetics* (IV Ed.). Oxford University Press, Oxford.
- Singh B D. *Fundamentals of Genetics*. Kalyani Publishers, New Delhi
- Srivastava & Tyagi. *Selected Problems in Genetics* (Vol.1-3). Anmol Publications Pvt. Ltd., New Delhi
- Khanna VK. *Genetics–Numerical Problems*. Kalyani Publishers, New Delhi.

e-reading: <http://ecourses.iasri.res.in/>

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

Paper – XIII: Growth and Development of Horticultural Crops

Total Workload: 04 lectures per week

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

• To develop understanding of growth and development of horticultural crops which have implications in their management.

Unit –I: Growth and Development

Growth and development-definitions, components, photosynthetic productivity, Canopy photosynthesis and productivity, leaf area index (LAI) - optimum LAI in horticultural crops, canopy development; different stages of growth, growth curves, Crop development and dynamics (Case studies of annual/perennial horticultural crops), growth analysis in horticultural crops.

Unit –II: Role of Crop Growth

Plant bio-regulators- auxin, gibberellin, cytokinin, ethylene inhibitors and retardants, basic functions, biosynthesis, role in crop growth and development, propagation, flowering, fruit setting, fruit thinning, fruit development, fruit drop, and fruit ripening.

Unit –III: Flowering

Flowering-factors affecting flowering, physiology of flowering, photoperiodism-long day, short day and day neutral plants, vernalisation and its application in horticulture, pruning and training physiological basis of training and pruning-source and sink relationship, translocation of assimilates.

Unit –IV: Seed Development

Physiology of seed development and maturation, seed dormancy and bud dormancy, causes and breaking methods in horticultural crops. Physiology of fruit growth and development, fruit setting, factors affecting fruit set and development, physiology of ripening of fruits-climatic and non-climacteric fruits. Physiology of fruits under post-harvest storage.

Reference Books:

- Basra, A. S. (2004). *Plant Growth Regulators in Agriculture & Horticulture*. HAWARTH Press. New York.
- Delvin, R.M. (1986). *Plant Physiology*. CBS. Delhi.
- Richard, N. Arteca. (2004). *Plant Growth Substances*. CBS. New Delhi.
- Salisbulry. (2007). *Plant Physiology*. CBS. New Delhi.
- Taiz, L. (2010). *Plant Physiology*. SINAUR. USA.
- Zeiger. (2003). *Plant Physiology*. PANIMA. New Delhi.

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

Paper – XIV: Nursery Management

Total Workload: 04 lectures per week

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

· To study aims, objectives & importance of Nursery Management.

Unit –I: Introduction to Horticulture Nursery

Nursery Management, plant propagation methods, types, classification. Vegetative propagation methods. Tray cultivation and open farm growing bags. Growing of commercially crops which are available in local market

Unit –II: Plant Nutrition

Plant Nutrition Management in Nursery, plant protection in Nursery Management, Management practices in Horticulture. Nutritional importance of major and micro nutrients for nursery plantation. Types and uses for various chemical & organic fertilizers.

Unit –III: Mass Production

Mass Production of Nursery plants, Ornamental Horticulture Nursery. Commercial mass production of crops. Market values of nursery plants. Study of indoor & outdoor plant. Methods of growing nursery in/ out door plants

Unit –IV: Government Regulations

Government regulation norms and policies in Horticulture Nursery Management. Marketing planning for nursery products. Plant Library Concepts and Operations Economics. Methods and planning for Proper Nursery according to Government Policy.

Reference Books:

- Bhimraj Bhujbal (ed.). (2012). *Resource book on Horticulture Nursery Management*, YCMOU, NAIP, ICAR
- Kumar, V. (2011). *Nursery and Plantation Practices in Forestry*. Scientific Publisher, Jodhpur
- Landis, T.D., Tinus, R.W. and Barnett, J.P. (1999). *The Container Tree Nursery Manual: Seedling Propagation*. Agriculture Handbook, 674. Washington, DC: U.S. Department of Agriculture, Forest Service
- Rahudkar W.B., Bhujbal BG, Madhuri Sonawane, Hemraj Rajput, (2010). *Horticulture Nursery Management*, YCMOU, Textbook Publication No. AGR 227.
- Randhawa G.S., A. Mukhopadhyay (2001). *Floriculture in India*. Book published by Allied Publishers Limited, New Delhi

- Roshetko, J.M., Tolentino, E.L., and Other (2010). *Tree Nursery Sourcebook - Options in Support of Sustainable Development*. World Agroforestry Center-ICRAF and Winrock International. Bogor, Indonesia

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester -II

Horticulture and Floriculture

Paper-XV: Laboratory Work- Principles of Genetics and Cytogenetics

Total Workload: 04 lectures per week

Distribution of Workload:

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

Objectives:

- To understand Genetics variation in plants

Practicals:

1. Study of fixatives and stains.
2. Preparation of microscopic slide of mitosis-onion root tips and identification.
3. Methods of finding out the gametes and gametic recombinations.
4. Interaction of genes- I, Without modification of F2 ratio, Complementary.
5. Gene interactions-II, Supplementary, Epistasis, & Inhibitory.
6. Gene interactions-III, Additive, Duplicate and Lethal.
7. Study of linkage of genes.
8. Induction of polyploidy using colchicines, Induction of mutation by using Chemicals

Scheme of practical evaluation

Internal practical evaluation

i) Submission of practical record book	50marks
ii) Submission of visit report	20marks
iii) Viva–Voce	15marks
	15marks

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SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester -II

Horticulture and Floriculture

Paper-XVI: Laboratory Work- Growth and Development of Horticultural Crops

Total Workload: 04 lectures per week

Distribution of Workload:

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

Objectives:

- To know the different stages of growth in plants.

Practicals:

1. Understanding dormancy mechanisms in seeds, tubers and bulbs and stratification of seeds, tubers and bulbs,
2. Visit to arid, subtropical and temperate horticultural zones to identify growth and development patterns,
3. Techniques of growth analysis, evaluation of photosynthetic efficiency under different environments,
4. Study of growth regulator functions, hormone assays,
5. Understanding ripening phenomenon in fruits and vegetables,
6. Study of impact of physical manipulations on growth and development,
7. Study of chemical manipulations on growth and development,
8. Understanding stress impact on growth and development

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 – I, Semester -II
Horticulture and Floriculture

Paper-XVII: Laboratory Work- Nursery Management

Total Workload: 04 lectures per week

Distribution of Workload:

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

Objectives:

- To understand planting material as an initial investment is a well realized factor for persons engaged in Horticulture field.

Practicals:

- 1.Plant propagation by seeds
- 2.Grafting, budding, air layering
- 3.Shade net development and management.
- 4.Ornamental plant development by cutting method
5. Vegetable seedling development
6. Identification of garden tools/ implements.
7. Potting and repotting techniques.
8. Preparation of seed bed/nursery bed.

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 – I, Semester -II
Horticulture and Floriculture

Paper-XVIII: 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 be collected and displayed with proper scientific preservation and knowledge. This work should be completed within a span of year.

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