

**S.P. Mandali's**  
**RAMNARAIN RUIA AUTONOMOUS COLLEGE**



Syllabus for: T. Y

Program: B. Sc. (Applied component)

Course Code: Horticulture and gardening  
(RUSACHOR)

(Credit Based Semester and Grading System with effect  
from the academic year 2019–2020)

## SEMESTER V

Course Code	UNIT	TITLE	Credits	L / Week
RUSACHOR501	Horticulture and Gardening -I		2	4
	I	Introduction to horticulture	2	1
	II	Propagation practices		1
	III	Manures, fertilizers and diseases		1
	IV	Garden operations for horticulture		1
RUSACHORP 501	Practicals based on all courses in theory		2	4

## SEMESTER VI

Course Code	UNIT	TITLE	Credits	L / Week
RUSACHOR 601	Horticulture and Gardening - II		2	4
	I	Landscape gardening	2	1
	II	Horticulture produce		1
	III	Commercial production		1
	IV	Post-harvest technology & entrepreneurship in horticulture		1
RUSACHORP 601	Practicals based on all the courses in theory		2	4

**Course Code: RUSACHOR 501**  
**Course Title: Horticulture and Gardening – I**  
**Academic year 2019 - 20**

**Learning objectives:**

- Horticulture and gardening as an applied component is to nurture the interest and awareness about the various techniques in horticulture (propagation practices, use of various fertilizers and manures, gardening operations)
- The basic and fundamental aspects of horticulture.
- General foundation for further studies and practice in horticulture or its allied fields.

**Learning Outcomes:** Upon successful completion of this course, students will acquire basic knowledge about the fundamental aspects of horticulture. The students in turn will find it easier to undergo other horticultural courses. They will be able to propagate plants by various methods they learnt and will be able to perform different garden operations, organic farming, knowledge about the selection and use of various fertilizers and manures.

**Detailed syllabus**

RUSACHOR 501	Title: Horticulture and Gardening – I	Credits – 2
<b>UNIT I</b>	<b>Introduction To Horticulture</b>	<b>15 Lectures</b>
	Definition, importance and objectives of Horticulture, branches of Horticulture, Pomology, Olericulture, Landscape Gardening, Nurseries and development	
	Allied branches – Apiculture – Bee box, honey bee life cycle and role of apiculture in pollination, Sericulture – Silkworm life cycle, different types with host plant, Social Forestry, Exhibition: aims and objectives.	
	Important Horticulture Research Institutes and Government Schemes for strategy plantations <ul style="list-style-type: none"> <li>• Konkan Krishi Vidyapeeth – Dapoli</li> <li>• National Research Centre for grapes – Nashik.</li> <li>• Regional Fruit Research centre – Pune</li> <li>• National Institute of post harvest technology – Talegaon</li> <li>• Central Potato Tuber Research Institute ( CPTRI) – Shimla</li> </ul>	
	Role of Horticulture in rural economy and employment generation	
	Horticulture Consultancy	
	Urban Horticulture and Ecotourism	
<b>UNIT II</b>	<b>Propagation Practices</b>	<b>15 Lectures</b>
	<b>By Seeds:</b> Advantages and disadvantages, method of seed propagation, production of seeds, handling, collection and storage Sowing, transplanting of seedlings and hardening, seed treatment to control diseases, seedling diseases and their control.	
	<b>By specialized Vegetative structures:</b> Bulbs, tubers, corms, rhizomes, root stock, runners, offsets and suckers.	
	<b>Artificial methods of plant propagation</b> <ul style="list-style-type: none"> <li>• Cutting– Root cutting, stem cuttings, and leaf cuttings. Use of PGR's for rooting.</li> <li>• Layering – Definition, Types: Simple, compound, (Serpentine) Tip, Trench, Mound, Air Layering.</li> <li>• Grafting-Definition, advantages and disadvantages. Types:</li> </ul>	

	<p>Splice, whip/ tongue, side, veneer, cleft, bark, epicotyls, approach, repair grafting – Enarching, bridge and bracing.</p> <ul style="list-style-type: none"> <li>Budding – Definition advantages and disadvantages. Types: T- budding, shield, patch, ring budding.</li> <li>Developing new varieties: Technique of emasculation and bagging, role of polyploidy in the production of seedless varieties in plants.</li> </ul>	
	Application of Tissue Culture in relation to Horticulture.	
<b>UNIT III</b>	<b>Manures, Fertilizers And Diseases</b>	<b>15 Lectures</b>
	<b>Manures:</b> Definition, importance, important manures FYM(compost), oil cakes, green manure, organic manures and vermicompost.	
	<b>Fertilizers:</b> Definition, Types – Straight, Compound and mixed. Nitrogenous (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , Urea, Ca(NO <sub>3</sub> ) <sub>2</sub> , NH <sub>4</sub> Cl, Phosphatic (Superphosphate, Bone meal), Potassic (Muriate of potash, K <sub>2</sub> SO <sub>4</sub> )	
	<b>Biofertilizers:</b> Bacteria, Cyanobacteria, Mycorrhiza, Sea weeds.	
	<b>Horticultural plant diseases</b> and their control.	
	Fungal diseases- Rust, Smut, Powdery mildew.	
	Bacterial – Citrus canker, Bacterial wilt.	
	Viral – TMV, Leaf curl.	
	Pests – common pests on horticultural crops – Aphids, mealy bugs, beetle, stem borer, caterpillars, and rats.	
	Friends of farmers: Earthworm, snakes and predaceous fungi.	
	Scouting for insect and pests.	
<b>UNIT IV</b>	<b>Garden Operations For Horticulture</b>	<b>15 Lectures</b>
	Selection of site, Preparation of soils for garden	
	Mulching, top- dressing, blanching	
	Sowing, transplanting, tree transplanting,	
	Irrigation - Overhead, Surface, Underground	
	Weeding and pruning- Principles, Objectives and general technique.	
	Water management and conservation through horticulture, Dry land Horticulture.	
	<b>Organic Farming:</b> Definition, Scope, Indian scenario, Future scope.	
<b>PRACTICALS</b>		
<b>RUSACHORP 501</b>	<b>Horticulture and Gardening – I</b>	<b>Credits - 2</b>
1	Garden implements and their uses.	
2	Different types of pots & Potting medium , Potting and repotting	
3	Propagation practices by seed, Vegetative propagation, cutting, layering, budding,grafting .	
4	Identification of : Fertilizers – Identification by physical and chemical methods –Urea , Ammonium sulphate , Potassium sulphate, super phosphate . Manures – Identification of plants as green manure – <i>Gliricidia</i> , <i>Crotolaria</i> , <i>Leucaena</i> Biofertilizers – Identification (material as slides) VAM, <i>Nostoc</i> , <i>Rhizobium</i> .	

5	Soil pH, Use of soil testing Kit for organic testing Electrical conductivity, pH of water.
6	Diseases and pests Fungal – Powdery mildew ,Rust ,Wilt, Blight, Smut, Bacterial – Canker ,Wilt Viral – Leaf curl ,yellow vein Mosaic Insects – Sucking, Biting, Chewing, Borers &Ants, Scouting for insect and pests Non Insects pests- Nematodes, Rodents.
7	Preparation of natural insecticides – Neemarka, Dashparniarka, Seetaphal powder, Tobacco extracts. Biopesticides: <i>Beauveria/ Verticillium/ Trichoderma</i>
8	Liquid fertilizers (Assignments)
9	Project – Each student should individually <b>initiate</b> a project related to any topic from the syllabus.

## SEMESTER VI

**Course Code: RUSACHOR 601**  
**Course Title: Horticulture and Gardening – II**  
**Academic year 2019 - 20**

### Learning objectives:

- Basic principles of landscape design.
- The importance of environmental conditions to landscape plant selection and placement.
- Alternative farming technology, vertical gardening, post-harvest techniques

**Learning Outcomes:** Upon successful completion of this course, students will be able to: Suggest plants suitable for various locations in a garden, Discuss growth and development patterns for fruit and vegetable species, Explain production conditions and practices for fruit, vegetable crops and soilless cultivation and compare the various cultural systems, Develop management plans for soil fertility, irrigation, and pest control in fruit and vegetable production. Discuss and evaluate horticulture as a business.

### Detailed Syllabus

RUSACHOR 601	Title: Horticulture and Gardening – II	Credits – 2
<b>UNIT I</b>	<b>Landscape gardening</b>	<b>15 Lectures</b>
	Principles of landscaping and types of garden: Formal and Informal.	
	Indoor plants and indoor gardens- Terrarium/ Bottle garden, Dish garden.	
	Vertical garden.	
	Important garden features- Paths and Avenues, Hedges and Edges, Lawn, Flowerbeds, Arches and Pergolas, Fencing, Water bodies, Rock garden & Plants suitable for different locations and climates.	
	Lawn- Purpose of preparation of lawn, Method of preparation of lawn, management of lawn and lawn plants.	
	Soil manipulation for plantation of desirable varieties.	
	Mughal, Buddhist, Botanical garden, Theme park	

	Important Gardens of India - Shalimar (Shrinagar), Vrindavan (Mysore), Veer Jijamata Udyan (Mumbai), Sanjay Gandhi National Park	
<b>UNIT II</b>	<b>Horticultural Produce</b>	<b>15 Lectures</b>
	<b>High –tech Horticultural production-</b> Green house technology- Meaning, types, layout and construction, irrigation systems. Care and attention. Hardening of plants. Space gardens.	
	Hydroponics:Types and techniques	
	Importance of Horticulture in food and nutritional security	
	<b>Floriculture</b> – Scope and importance, soil and climatic requirement and cultivation practices and Economics of green house production of Gerbera, Carnation, Roses, Orchids.Propagation techniques, packaging and marketing, enhancing and delaying period of bloom by special methods. Floral decoration, Florist shop management.	
	<b>Types and roles of pollinators</b>	
<b>UNIT III</b>	<b>Commercial production</b>	<b>15 Lectures</b>
	<b>Commercial production of the following</b> – in relation to propagation, post plantation care, harvesting, post harvest management & varieties. <ul style="list-style-type: none"> <li>• Rhizomes- Ginger</li> <li>• Vegetables- Spinach</li> <li>• Fruits- Mango, Grapes &amp; Coconut- products like coco peat/ Coir etc.</li> <li>• Spices/condiments- <i>Cinnamomum zeylanicum</i></li> <li>• Medicinal plants- <i>Moringa pterigosperma</i>, <i>Stevia rebaurdina</i> (Madura)</li> <li>• Aromatic plant- <i>Vetiveria zizanoides</i>, Patchouli</li> </ul>	
<b>UNIT IV</b>	<b>Post-Harvest Technology &amp; Entrepreneurship In Horticulture</b>	<b>15 Lectures</b>
	Maturity- Factors responsible for maturity & ripening methods used for delaying ripening.	
	Harvest- Time of harvest, harvesting and handling of harvested products	
	Storage of fresh produce- Types of storage of fruits & vegetables	
	Fruit & vegetables preservation technology.	
	Marketing- grading, packing and transportation. Ways of increasing the market value and shelf life of horticultural produce.	
	Horticultural business, management and Entrepreneurship development	
	Horticulture as a business: definition and nature, organization, planning and operation of Horticulture farm business	
<b>PRACTICALS</b>		
<b>RUSACHORP 601</b>	<b>Horticulture and Gardening – II</b>	<b>Credits - 2</b>
1	Preparation of garden layout	
2	List of plants suitable for garden locations- 2-3 plants for each location .	
3	Identification of important horticultural plants <ol style="list-style-type: none"> <li>1. Herbs – foliage any 2 and flowering any 2</li> <li>2. Shrubs – foliage any 2 flowering any 2</li> </ol>	

	3. Trees – foliage any 2 and flowering any 2 4. Climbers – any 2 5. Lianas – any 2 6. Epiphytes – any 2 7. Creepers –any 2 8. Trailers – any 2 9. Aquatic plants – any 3 ( preferably various habitat) 10. Succulents – any 2 11. Weeds –any 10
4	Method of preparing Bonsai, Bottle Garden/Terrarium, Hanging Baskets, Dish Garden
5	Flower arrangements –Indian (Gajara , veni, garland , bouquet - Baskets , hand ,torch type , table floral arrangement/ Floating rangoli/Biorangoli), Japanese and western type, dry flower arrangement
6	Preparation of Jams, Jellies, Squashes/ Syrups, Pickle, sauces
7	Varieties of banana/ watermelon/ brinjal/ grapes/chilli
8	Drying of vegetables and fruits Gavar/chickoo/carrot/ beetroot/spinach/ lemon grass/ wheat grass/ginger
9	Blanching of different plant foods.
10	Fruit and vegetable carving, Bio-jewelry (Demonstrations)
11	Green house plants- Information regarding to soil, temperature, irrigation, fertilizer requirements and propagation methods for <i>Anthurium</i> , <i>Gerbera</i> , Orchids, Carnation, Roses, Capsicum, Tomato, Strawberry
12	<b>Project – Each student should individually present a project related to Horticulture .It should be duly certified presented at practical examination. Project presentation at college level compulsory.</b>

**Visits :** To Garden /Parks / Nurseries/ Exhibition / Horticulture industries / Research Station and record of visits should be duly certified and presented at practical examination.

**Journal:** Students will not be allowed for practical examination without their journal duly certified.

### References

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## MODALITY OF ASSESSMENT

### Theory Examination Pattern:

A) Internal Assessment - 40%: 40 marks.

Sr No	Evaluation type	Marks
1	Assignment / Field Visit/ Submission/ On-line test/ Active Participation (attentiveness/ability to answer questions)/ Participation in academic or Co-curricular activities	20
2	One class Test (multiple choice questions / objective)	20

B) External examination - 60 %

### Semester End Theory Assessment - 60 marks

- i. Duration - These examinations shall be of **2 hours** duration.
- ii. Paper Pattern:
  1. There shall be **05** questions each of **12** marks and **01** question of **12** marks. On each unit there will be one question & last question will be based on all the **04** units.
  2. All questions shall be compulsory with internal choice within the questions.

Questions	Options	Marks	Questions on
Q.1 ) A, B, C	Any 2 out of 3	12	Unit I
Q.2) A, B, C	Any 2 out of 3	12	Unit II
Q.3) A, B, C	Any 2 out of 3	12	Unit III
Q.4) A, B, C	Any 2 out of 3	12	Unit IV
Q.5) a, b, c, d, e.	Any 3 out of 5	12	All units

### Practical Examination Pattern:

#### (A) Internal Examination:

Heading	Practical
Journal	05
Practical/ Field Report/ Presentation	35
<b>Total</b>	<b>40</b>

#### (B) External (Semester end practical examination):

Particulars	Practical
Laboratory work and/or <i>Viva voce</i>	60
<b>Total</b>	<b>60</b>

## PRACTICAL BOOK/JOURNAL

The students are required to present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination.

**In case of loss of Journal and/ or Report, a Lost Certificate should be obtained from Head/ Co-ordinator / Incharge of the department; failing which the student will not be allowed to appear for the practical examination.**

### Overall Examination and Marks Distribution Pattern

#### Semester- V and VI

Course	501/601		502/602		Total per Course	Grand Total
	Internal	External	Internal	External		
Theory	40	60	40	60	100	200
Practicals	40	60	40	60	100	200

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