

# **UNIVERSITY OF MUMBAI**



**Syllabus for the F.Y.B.Voc.**

**Program: B.Voc.**

**Course : Green House Management**

**(Sem I & II)**


(Credit Based Semester and Grading System with  
effect from the academic year 2014–2015)


**SEMESTER I**


Course Code	UNIT	TOPICS	Credits	L / Wk
<b>UVGHM101 to 104&amp; UVGHMP101 Skill Component</b>			<b>18</b>	
<b>UVGHM101</b>	<b><u>Soil Science</u></b>		<b>2</b>	<b>2</b>
	I	Introduction to Soil Science & Soil Physics		
	II	Soil Chemistry & Soil Microbiology		
<b>UVGHM102</b>	<b><u>Soil Cultivation</u></b>		<b>2</b>	<b>2</b>
	I	Cultivation of Soil		
	II	Soil Erosion and Conservation		
<b>UVGHM103</b>	<b><u>Propagation Techniques-I</u></b>		<b>2</b>	<b>2</b>
	I	Natural Methods of Plant Propagation-I		
	II	Natural Methods of Plant Propagation-II		
<b>UVGHM104</b>	<b><u>Propagation Techniques-II</u></b>		<b>2</b>	<b>2</b>
	I	Artificial Methods of Plant Propagation-I		
	II	Artificial Methods of Plant Propagation-II		
<b>UVGHM P101</b>	<b>Practicals based on theory of Skill Component</b>		<b>10</b>	<b>10</b>
<b>UVGHM105 to 107 &amp;UVGHMP102 General Education Component</b>				
<b>UVGHM105</b>	<b><u>Communication Skills-I</u></b>		<b>2</b>	<b>2</b>
	I	Core Communication Skills-I		
	II	Core Communication Skills-II		
<b>UVGHM106</b>	<b><u>Basics of Plant Biology- I</u></b>		<b>2</b>	<b>2</b>
	I	External Morphology		
	II	Plant Anatomy		
<b>UVGHM107</b>	<b><u>Nursery Operations-I</u></b>		<b>2</b>	<b>2</b>
	I	Cultivation of Nursery Plants		
	II	Nursery Operations		
<b>UVGHMP102</b>	<b>Practicals based on theory of General Education Component</b>		<b>6</b>	<b>6</b>


**SEMESTER II**


Course Code	UNIT	TOPICS	Credits	L/Wk
<b>UVGHM201 to 204 &amp; UVGHMP201 Skill Component</b>			<b>18</b>	
<b>UVGHM201</b>	<b><u>Green House Construction</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Fundamentals of Green House Technology		
	<b>II</b>	Structure and Construction of a Green House		
<b>UVGHM202</b>	<b><u>Green House Management Basics-I</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Green House Environment		
	<b>II</b>	Green House Media and Nutrition		
<b>UVGHM 203</b>	<b><u>Green House Management Basics-II</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Green House Pests and Disease Management and PGRs		
	<b>II</b>	Post Production Handling		
<b>UVGHM 204</b>	<b><u>Economics of Green House Setup</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Total Construction & Production Cost-I		
	<b>II</b>	Total Construction & Production Cost-II		
<b>UVGHM P201</b>	<b>Practicals based on theory of Skill Component</b>		<b>10</b>	<b>10</b>
<b>UVGHM205 to UVGHM207 &amp;UVGHMP202 General Education Component</b>			<b>12</b>	
<b>UVGHM205</b>	<b><u>Communication Skills-II</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Elements in Written Communication-I		
	<b>II</b>	Elements in Written Communication-II		
<b>UVGHM206</b>	<b><u>Basics of Plant Biology- II</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Sexual reproduction in Plants		
	<b>II</b>	Plant Breeding		
<b>UVGHM207</b>	<b><u>Nursery Operations-II</u></b>		<b>2</b>	<b>2</b>
	<b>I</b>	Nursery Management		
	<b>II</b>	Types of Nurseries		
<b>UVGHMP202</b>	<b>Practicals based on theory of General Education Component</b>		<b>6</b>	<b>6</b>

<b>Semester I UVGHM101</b>	<b>L</b>	<b>Cr</b>
<b>Paper I -- <u>SOIL SCIENCE</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Introduction to Soil Science and Soil Physics</u></b> <ul style="list-style-type: none"> <li>• Pedology</li> <li>• Soil Genesis</li> <li>• Factors of soil formation</li> <li>• Soil profile and its development.</li> <li>• Functions of Soil</li> <li>• Types of Soils of India</li> <li>• Soil Physics <ul style="list-style-type: none"> <li>○ Composition of soil, Soil texture, Influence of soil texture on soil structure, Soil, air water, movement of water in the soil, soil erosion by water, Thermal properties of soil. Effect of soil temperature on soil properties and on plant growth, soil conductivity</li> <li>○ Soil physical constrains affecting crop production.</li> </ul> </li> </ul>	<b>15</b>	
<b><u>UNIT II Soil Chemistry and Soil Microbiology</u></b> <ul style="list-style-type: none"> <li>• Soil Chemistry <ul style="list-style-type: none"> <li>○ Chemical composition of soil, soil colloids, cation exchange capacity, soil salinity, acidic and alkaline soils and its remediation.</li> </ul> </li> <li>• Soil Microbiology <ul style="list-style-type: none"> <li>○ Soil biota, soil microbial ecology, types of organisms, microbial interaction, soil characteristics influencing growth and activities of micro flora and fauna, biochemical composition, biodegradation of soil organic nutrients</li> <li>○ Soil fertility: evaluation, soil testing, plant and tissue tests and biological methods, irrigation water quality.</li> </ul> </li> </ul>	<b>15</b>	
		


<b>Semester I UVGHM102</b>	<b>L</b>	<b>Cr</b>
<b><u>Paper II – Soil Cultivation</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Cultivation of Soil</u></b>	<b>15</b>	
<ul style="list-style-type: none"> <li>• Implements required for soil cultivation</li> <li>• Types of soil cultivation- Types of digging, mulching.</li> <li>• Soil Fertility <ul style="list-style-type: none"> <li>○ Definition, Essential elements in plant nutrition,</li> <li>○ Nutrient cycles in soil,</li> <li>○ Maintenance of soil fertility- Crop rotation, use of Manures and Fertilizers <ul style="list-style-type: none"> <li>▪ Use of manures and fertilizers,</li> <li>▪ Classification of manures and fertilizers (Bulky organic manures- FYM, compost, slurry from biogas plant, animal excreta, green manures;fertilizers- straight, complex and mixed. Biofertilizers (nitrogen fixing, phosphate solubilising) , mycorrhiza</li> </ul> </li> </ul> </li> <li>• Methods of application of fertilizers</li> </ul>		
<b><u>UNIT II Soil Erosion and Conservation</u></b>	<b>15</b>	
<ul style="list-style-type: none"> <li>• Types of erosion, and agents of erosion, Natural - water, wind and accelerated erosion- natural calamities and anthropogenic pressures.</li> <li>• Strategies for soil conservation- physical, agronomic and agrostological methods of soil conservation. Vanamahotsava.</li> <li>• Case Study on soil conservation</li> <li>• Role of horticultural practices in soil and water conservation.</li> </ul>		
		


<b>Semester I UVGHM103</b>	<b>L</b>	<b>Cr</b>
<b>Paper III -- Propagation Techniques- I</b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Natural Methods of Plant Propagation –I</u></b> <ul style="list-style-type: none"> <li>• Introduction to Plant Propagation</li> <li>• Propagating Structures</li> <li>• Equipments and Media</li> <li>• Introduction to Methods of Plant Propagation</li> <li>• Propagation by Seed: <ul style="list-style-type: none"> <li>○ Origin and development of the seed,</li> <li>○ Seed Germination, types of seed germination,</li> <li>○ Seed Dormancy – types and methods to overcome,</li> <li>○ Seed Viability- causes for loss of viability, methods to prolong seed viability</li> <li>○ Seed storage</li> <li>○ Seed Health, Seed testing and Seed Certification</li> <li>○ Seed Technology- Seed Production and Seed Handling,</li> <li>○ Growing Seedlings in Nursery,</li> <li>○ Transplanting and Hardening,</li> <li>○ Advantages and Disadvantages of Seed Propagation.</li> </ul> </li> </ul>	<b>15</b>	
<b><u>UNIT II Natural Methods of Plant Propagation –II</u></b> <ul style="list-style-type: none"> <li>• Propagation by Specialised Vegetative Structures: <ul style="list-style-type: none"> <li>• Apomixis, Seedlings and Propagules</li> <li>• Propagation by specialised Vegetative structures: <ul style="list-style-type: none"> <li>○ Aerial- Bulbils</li> <li>○ Sub-aerial- Runner, Stolon, Offset,</li> <li>○ Sub-terrestrial- Rhizome, Caudex, Bulbs, Corms, Tuberos Roots and Stems, Suckers</li> </ul> </li> </ul> </li> </ul>	<b>15</b>	
		


Semester I UVGHM104	L	Cr
<b><u>Paper IV -- Propagation Techniques - II</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I: Artificial Methods of Plant Propagation – I</u></b>	<b>15</b>	
<ul style="list-style-type: none"> <li>• Cutting- <ul style="list-style-type: none"> <li>○ Types: Root, Stem, Leaf Cuttings.</li> <li>○ Physiology of rooting of cuttings,</li> <li>○ Use of PGRs for rooting.</li> </ul> </li> <li>• Layering <ul style="list-style-type: none"> <li>○ Types- Simple, Compound (Serpentine), Tip, Trench, Mound, Air-layering.</li> <li>○ Advantages of Layering over cuttings.</li> </ul> </li> </ul>		
<b><u>UNIT II: Artificial Methods of Plant Propagation – II</u></b>	<b>15</b>	
<ul style="list-style-type: none"> <li>• <b>Grafting</b> <ul style="list-style-type: none"> <li>○ Tools required for Grafting,</li> <li>○ Types- Splice, Whip/tounge, side, veneer, cleft, bark, epicotyl.</li> <li>○ Approach, Repair Grafting- inarching, bridge and bracing.</li> <li>○ Union between Stock and Scion</li> <li>○ Graft incompatibility</li> <li>○ Stock Scion Relationship.</li> <li>○ Advantages and Disadvantages</li> </ul> </li> <li>• <b>Budding</b> <ul style="list-style-type: none"> <li>○ Tools required for Budding,</li> <li>○ Types- T-budding, shield, patch, ring budding.</li> <li>○ Bud selection and Certification</li> <li>○ After care of Budded Plants</li> <li>○ Advantages and Disadvantages of Budding</li> </ul> </li> </ul>		
		


<b>Semester I UVGHMP101</b>		<b>Cr</b>
<b>PRACTICAL Paper I – Skill Component</b>		<b>10</b>
1	Identification of types of soil, Estimation of Soil pH, Water Holding Capacity of soil, Use of soil testing kit	
2	Identification of Fertilizers by physical and chemical methods: Urea, Ammonium Sulphate, Potassium Sulphate, Super Phosphate Manures, Plants used as green manure, Biofertilizers	
3	Types of pots and potting media	
4	Propagation by seeds: methodology, testing of seed viability	
5	Study of seed dormancy and methods employed to overcome seed dormancy	
6	Vegetative Propagation : Using Bulbils, bulbs, tubers (stem and root), rhizome, Corm . Study of runner, offset, stolon and sucker	
7	Cutting: Stem and leaf, Air layering	
9	Budding and Grafting	
10 to 15	<b>Submission of a project related to any topic related to the syllabus. It should be duly certified and presented at the time of practical examination.</b>	
		




<b>Semester I UVGHM105</b>		<b>L</b>	<b>Cr</b>
<b>Paper V -- Communication Skills-I</b>		<b>30</b>	<b>2</b>
<b><u>UNIT I Core Communication Skills-1</u></b>		<b>15</b>	
<ul style="list-style-type: none"> <li>• Basic Language Skills: Grammar and Usage <ul style="list-style-type: none"> <li>○ Ability to fill in the blanks, correct errors, choose correct forms out of alternative choices, join clauses, rewrite sentences as directed, and replace indicated sections with single words / opposites / synonyms</li> </ul> </li> <li>• Verbal Communication Interactions for a variety of purposes <ul style="list-style-type: none"> <li>○ Interpersonal communication</li> <li>○ Small group communication</li> <li>○ Intellectual communication</li> <li>○ Cross-cultural communication</li> </ul> </li> </ul>			
<b><u>UNIT II Core Communication Skills-II</u></b>		<b>15</b>	
<ul style="list-style-type: none"> <li>• Non verbal communication <ul style="list-style-type: none"> <li>○ Personal appearance</li> <li>○ Listening skills</li> <li>○ Active listening</li> <li>○ Reflecting</li> <li>○ Clarifying</li> <li>○ Etiquettes and mannerisms</li> </ul> </li> </ul>			
			

Semester I UVGHM106	L	Cr
<b><u>Paper VI -- Basics of Plant Biology-I</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I : External Morphology</u></b> <ul style="list-style-type: none"> <li>• Plants and their habits</li> <li>• Morphology of Plants – Vegetative Organs <ul style="list-style-type: none"> <li>○ Roots- types and modifications</li> <li>○ Stems- Types and their modifications</li> <li>○ Leaves- Types and modifications</li> </ul> </li> <li>• Morphology of Plants – Reproductive Structures <ul style="list-style-type: none"> <li>○ Inflorescence- Types</li> <li>○ Flower- A modified shoot, Parts of a flower- Calyx, Corolla, Androecium and Gynoecium- types and their modifications.</li> <li>○ Fruit- Types of Simple, Compound and Aggregate fruits.</li> </ul> </li> </ul>	<b>15</b>	
<b><u>UNIT II : Plant Anatomy</u></b> <ul style="list-style-type: none"> <li>• Cells and Tissues- types of tissues, simple and complex.</li> <li>• Anatomy of Vegetative parts of higher plants: <ul style="list-style-type: none"> <li>○ Roots,</li> <li>○ Stems and</li> <li>○ Leaves</li> </ul> </li> </ul>	<b>15</b>	
		


Semester I UVGHM107	L	Cr
<b>Paper VII -- Nursery Operations-I</b>	<b>30</b>	<b>2</b>
<b><u>UNIT I : Cultivation of Nursery Plants:</u></b> <ul style="list-style-type: none"> <li>• <b><u>Types of Nursery Plants</u></b> <ul style="list-style-type: none"> <li>○ annuals</li> <li>○ biennials</li> <li>○ perennials</li> <li>○ herbaceous</li> <li>○ woody perennials and bulbous plants.</li> </ul> </li> <li>• <b><u>Identification, classification and growth habits of</u></b> <ul style="list-style-type: none"> <li>○ ornamental trees,</li> <li>○ shrubs and</li> <li>○ Climbers used for their ornamental value and as vegetables and fruits.</li> </ul> </li> </ul>	<b>15</b>	
<b><u>UNIT II: Nursery operations</u></b> <ul style="list-style-type: none"> <li>• Equipments and tools in nursery operations</li> <li>• Methods of Propagation of nursery plants, Potting , repotting</li> <li>• Nursery irrigation system</li> <li>• Methods of application of fertilizers</li> <li>• Harvesting, Packing, Storage and Marketing of Nursery Stock</li> </ul>	<b>15</b>	
		

<b>Semester I UV GHMP102</b>		<b>Cr</b>
	<b><u>PRACTICAL PAPER II- General Education Component</u></b>	<b>6</b>
1	Study of Root Morphology	
2	Study of Stem Morphology	
3	Study of Leaf Morphology	
4	Study of Types of Inflorescence	
5	Study of Flower Morphology	
6	Study of Fruit Morphology	
7	Study of Types of tissues	
8,9	Structure of the primary Dicot and Monocot Root, Stem and Leaf	
10-12	<b>Submission of a report on identification of</b> commercially important green house plants (minimum 5 of each) Herbs , Shrubs, Climbers, Epiphytes, Aquatic plants, Succulents, Cacti, ornamentals, house plants, vegetables and fruits)	
		

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Semester II UV GHM201	L	Cr
<u>Paper I -- Green House Construction</u>	<b>30</b>	<b>2</b>
<p><b><u>UNIT I Fundamentals Of Green House Technology</u></b></p> <ul style="list-style-type: none"> <li>● Planning and Designing <ul style="list-style-type: none"> <li>○ Site selection, Structures and Glazing</li> <li>○ Planning and Designing: Introduction, Basics of greenhouse design ; Bench Design</li> </ul> </li>   <li>● Types of Green House based on <ul style="list-style-type: none"> <li>○ shape</li> <li>○ utility</li> <li>○ construction</li> <li>○ covering material</li> </ul> </li> </ul>	<b>15</b>	
<p><b><u>UNIT II Structure and Construction of a Green House</u></b></p> <ul style="list-style-type: none"> <li>● Location,</li> <li>● frame work for various types of green house,</li> <li>● covering material,</li> <li>● construction of typical glass house/poly house/ net house,</li> <li>● construction of pipe framed greenhouse,</li> <li>● Construction of floors and Layout,</li> <li>● Design and development of low cost green house structures.</li> <li>● Automated greenhouses, microcontrollers, waste water recycling.</li> <li>● Green House World Scenario</li> <li>● Status in India</li> </ul>	<b>15</b>	
		

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<b>Semester II UVGHM202</b>	<b>L</b>	<b>Cr</b>
<b><u>Paper II – Green House Management Basics -I</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Green House Environment</u></b>	<b>15</b>	
<ul style="list-style-type: none"> <li>• Heating : Sources of heat</li> <li>• Cooling: Types of cooling</li> <li>• Environmental control: Air temperature, sunlight, Carbondioxide, Relative humidity, Wind, Rain</li> <li>• Light and Temperature:               <ul style="list-style-type: none"> <li>○ Light: Light requirement, automation, C3 and C4 plants, ways to control Photorespiration.</li> <li>○ Photoperiodism: Classification of plants into Long Day and Short Day Plants, Night Break, Perception of Photoperiodic Response, Effect of Light quality on Night Break, Phytochrome and its role in flowering, florigen. Practical Applications.</li> <li>○ Temperature: Heating and cooling of green house, ventilation and air movement,</li> <li>○ Vernalization.</li> </ul> </li> </ul>		
<b><u>UNIT II Green House Media and Nutrition</u></b>	<b>15</b>	
<ul style="list-style-type: none"> <li>• Preparation of soil for planting</li> <li>• Plant nutrition: Fertilizers, Hydroponics, Nutrient deficiencies and toxicities, Carbon dioxide</li> <li>• Water quality</li> <li>• Water sanitation</li> <li>• Irrigation               <ul style="list-style-type: none"> <li>○ Methods of irrigation, irrigation, Rules of watering, Hand watering, Perimeter watering, Overhead sprinklers, Boom watering, Drip irrigation, Micro irrigation</li> </ul> </li> <li>• Fertigation, management of nutrients through fertigation. Humidification</li> <li>• Advanced protected agricultural systems such as plastic mulches, row cover.</li> </ul>		
		

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<b>Semester II UVGHM203</b>	<b>L</b>	<b>Cr</b>
<b><u>Paper III -- Green House Management Basics-II</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Green House Pest and Disease Management and PGRs</u></b> <ul style="list-style-type: none"> <li>• Pest and Soil Organisms of Green house plants- Slugs, Insects, Bees, flie, Caterpillars, Millipedes, centipedes, Nematodes</li> <li>• Diseases of Green house plants: Bacterial, Fungal and viral diseases</li> <li>• Management of pest and diseases –Physical, chemical,Biological, IPM</li> <li>• Method of pesticide application: Types of equipments</li> <li>• Chemical Growth Regulation of Green house plants: <ul style="list-style-type: none"> <li>○ Auxins</li> <li>○ Giberrelins</li> <li>○ Cytokinins</li> <li>○ Ehylene</li> <li>○ Abscissic Acid</li> <li>○ Growth retardants</li> </ul> </li> </ul>	<b>15</b>	
<b><u>UNIT II Post Production Handling</u></b> <ul style="list-style-type: none"> <li>○ Vase life</li> <li>○ Refrigerated storage</li> <li>○ Dry storage</li> <li>○ Bud harvesting,</li> <li>○ Other approaches</li> </ul>	<b>15</b>	
		


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<b>Semester II UVGHM204</b>	<b>L</b>	<b>Cr</b>
<b><u>Paper IV -- Economics of Green House Set Up</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Total Construction and Production Cost - I</u></b> <ul style="list-style-type: none"> <li>• Estimated construction cost for basic green house module and different types of Green Houses and their maintenance with reference to the following: <ul style="list-style-type: none"> <li>○ Construction, fuel used, planting system, feeding system, growth medium.</li> </ul> </li> <li>• Operating costs and return from Green house</li> <li>• Total investment <ul style="list-style-type: none"> <li>○ Variable cost, Capital costs, fixed costs labour requirements</li> </ul> </li> <li>• Estimate of annual entrepreneurial profits <ul style="list-style-type: none"> <li>○ Entrepreneur revenue</li> <li>○ Cash flow analysis</li> <li>○ Comparative analysis and marketing implications</li> <li>○ Estimated return of labour management</li> <li>○ Analysis of economic viability</li> <li>○ Computation of payback period</li> <li>○ Economic indicators</li> </ul> </li> <li>• Income and expenditure statement</li> <li>• Estimate of capital requirement for maintenance</li> </ul>	<b>15</b>	
<b><u>UNIT II Total Construction and Production Cost - II</u></b> <ul style="list-style-type: none"> <li>• Market linkage</li> <li>• cost comparison of field and green house produced vegetables, fruits and flower</li> <li>• Financing</li> <li>• Profile of Green House industry in India</li> <li>• Success story- Minimum three</li> </ul>	<b>15</b>	
		




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<b>Semester II UVGHMP201</b>		<b>Cr</b>
	<b>PRACTICAL Paper I – Skill Component</b>	<b>6</b>
1	Study of different types of greenhouses	
2 to 5	Study of components of greenhouse, their fabrication, erection and construction details.	
6	Study of greenhouse core material and covering material	
7	Study of Greenhouse cooling, heating and ventilation system	
8	Lighting system, temperature control, in the green house Role of Carbon Di-oxide in greenhouse.	
9	Application of computer in greenhouse technology.	
10 to 12	At least 3 Field visits to various Green Houses and writing of a report on the same.	
13	<b>Project on Green house construction – a model of any type studied by the student. It should be duly certified and presented at the time of practical examination.</b>	
		


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<b>Semester II UVGHM205</b>	<b>L</b>	<b>Cr</b>
<b><u>Paper V -- Communication Skills- II</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Elements in Written Communication-I</u></b> <ul style="list-style-type: none"> <li>• Structure(the way the content is laid out)</li> <li>• Style( The way it is written)</li> <li>• Content(What you are writing about)</li> </ul>	<b>15</b>	
<b><u>UNIT II Elements in Written Communication-II</u></b> <ul style="list-style-type: none"> <li>• Purpose and types</li> <li>• Writing formal applications,</li> <li>• Writing Statement of Purpose (SOP)</li> <li>• Writing resume</li> </ul>	<b>15</b>	
		


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Semester II UVGHM206	L	Cr
<b>Paper VI --<u>Basics of Plant Biology-II</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Sexual Reproduction in Plants</u></b> <ul style="list-style-type: none"> <li>• Pollination</li> <li>• Fertilization</li> <li>• Embryo Development</li> <li>• Seed Development and Seed Germination</li> </ul>	<b>15</b>	
<b><u>UNIT II Plant Breeding</u></b> <ul style="list-style-type: none"> <li>• _Basics of Plant Breeding <ul style="list-style-type: none"> <li>○ Acclimatization:</li> <li>○ Hybridization</li> <li>○ Heterosis and Hybrid Seed Production</li> </ul> </li> <li>• Breeding Methods <ul style="list-style-type: none"> <li>○ Mutation Breeding</li> <li>○ Polyploidy Breeding</li> </ul> </li> </ul>	<b>15</b>	
		


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Semester II UVGHM207	L	Cr
<b><u>Paper VII -- Nursery Operations-II</u></b>	<b>30</b>	<b>2</b>
<b><u>UNIT I Nursery Management</u></b> <ul style="list-style-type: none"> <li>• Role of Nurseries in Horticulture Development</li> <li>• Plant Nutrition and its Management in Nursery <ul style="list-style-type: none"> <li>○ Media for growing plants- soil, sand, peat, sphagnum moss, vermiculite, perlite, pumice, cocopeat</li> </ul> </li> <li>• Plant Protection in Nursery Management <ul style="list-style-type: none"> <li>○ control of pests and disease, IPM</li> </ul> </li> </ul>	<b>15</b>	
<b><u>UNIT II Types of Nurseries</u></b> <ul style="list-style-type: none"> <li>• Types of Plant Nurseries - <ul style="list-style-type: none"> <li>○ Fruit plant nurseries,</li> <li>○ Vegetable nurseries,</li> <li>○ Ornamental plant nurseries Cacti and succulants, ferns, palms and foliage plants.</li> <li>○ Medicinal and Aromatic plants nurseries,</li> <li>○ Forest plant nurseries,</li> </ul> </li> <li>• Types of Nurseries According to the Type of Sale – <ul style="list-style-type: none"> <li>○ Whole sale nurseries,</li> <li>○ Private nurseries,</li> <li>○ Mail order nurseries.</li> </ul> </li> <li>• Hi Tech Nurseries.</li> </ul>	<b>15</b>	
		

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	<b>Semester II UVGHMP202</b>	<b>Cr</b>
	<b>PRACTICAL PAPER II- General Education Component</b>	<b>6</b>
1	Identification of Nursery Plants	
2	Study and preparation of Media required for nursery plants.	
3 to 6	<b>Internship</b> in any one of the types of nurseries mentioned in theory syllabus. Nursery	
		

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**References**

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- Pant V, Nelson. 1991. *Green House Operation and Management* . Bali Publ.
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- George Acquah. *Horticulture, Principles and Practices* . Eastern Economy Eddition.
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- Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices* . Agrobios, India
- Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- Prasad S and Kumar U . *Green House Management for Horticultural Crops*. Agrobios India
- Biswas T D and Mukherjee S K . *Text Book of Soil Science* by, Tata Mc Graw-Hill Publishing Company Limited.
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**Scheme of Examinations**

**Theory + Practical Total Marks 800/ Semester**

<b><u>Theory Course:</u></b>	<b>Per Paper Total 100 Marks</b>
<b>For Internal Assessment / Paper</b>	<b>25 marks</b>
One periodical test on class instructions	20 marks
Active participation in class	05 marks
<b>External Assessment</b>	<b>75 Marks</b>
<b><u>Practical Course:</u></b>	<b>Per Practical 50 Marks</b>
<b>External Assessment</b>	<b>30 marks</b>
<b>Project/ Internship/ Report Submission</b>	<b>20 marks.</b>
(during External Assessment Examination)	

**Note:**

1. 30 Lectures/ Sem is equivalent to 2 Lect/week.
2. Practical shall be of 3h duration
3. A minimum of four three field excursions(with at least one beyond the limits of Mumbai) for Green house studies are compulsory. Field work of not less than eight hours duration is equivalent to one period per week for a batch of fifteen students.
4. A candidate will be allowed to appear for the practical examinations only if he/she submits a certified journal of FYBVoc GHM and the Field Report or a certificate from the Head of the Department/Institute to the effect that the candidate has completed the practical course of FYBVoc GHM as per the minimum requirements. In case of loss of journal a candidate must produce a certificate from the Head of the Department/ Institute that the practicals for the academic year were completed by the student. However though such a candidate will be allowed to appear for the practical examination, the marks allotted for the journal will not be granted.

