

UNIVERSITY OF MUMBAI



**Syllabus for the S.Y.B.Voc.
Program: B.Voc.
Course : Green House Management**

(Credit Based Semester and Grading System with
effect from the academic year 2016–2017)

University of Mumbai Credit Based & Grading System
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SEMESTER III


Course Code	UNIT	TOPICS	Credits	L /Wk
UVGHM301 - 303 & UVGHMP301-303 Skill Component			18	
UVGHM301	<u>Nutrients for green house crops</u>		2	2
	I	Availability and Absorption of Nutrients, Nitrogen Metabolism		
	II	Functions and Deficiency Symptoms of Essential Minerals.		
UVGHM302	<u>Pollination in green house</u>		2	2
	I	Methods of Pollination in Green house		
	II	Specific pollination methods in green house grown crops.		
UVGHM303	<u>Organic fertilizers & irrigation systems</u>		2	2
	I	Naturally Occurring Organic Fertilizers and Production of Organic Fertilizers		
	II	Types & Components of Irrigation Systems		
UVGHM P301-303	Practicals based on theory - Skill Component		12	
UVGHM304-306 & UVGHMP304-305 General Education Component			12	
UVGHM304	<u>Home Gardening – III</u>		2	2
	I	Tropical Indoor Plants: Culture & Factors for Growing		
	II	Landscaping-II		
UVGHM305	<u>Sustainable development-I</u>		2	2
	I	Sustainable Development –I		
	II	Sustainable Development –II		
UVGHM306	<u>Communication skills III & Basics of Computers-III</u>		2	2
	I	General communication Skill –III		
	II	Basics of Computer- III		
UVGHMP304 -305	Practicals based on theory of General Education Component		6	6

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Course Code	UNIT	TOPICS	Credits	L / Wk
UVGHM401 -403& UVGHMP401-403 Skill Component			18	
UVGHM401	<u>Soilless Cultivation -II</u>		2	2
	I	Hydroponics : Commercial Aspects and Recent Advancements.		
	II	Hydroponics: Techniques and Media.		
UVGHM402	<u>Organic Cultivation Of Green House Crops</u>		2	2
	I	Principles & Advantages of Organic cultivation		
	II	Methods of Organic Cultivation		
UVGHM403	<u>Propagation, Planting And Caring Of Green House Plants</u>		2	2
	I	Ornamental ferns , foliage plants and Cacti		
	II	Fruit crops ,Vegetables and exotic vegetables		
UVGHM P401-403	Practicals based on theory of Skill Component		10	
UVGHM404to406 &UVGHMP404-405 General Education Component				
UVGHM404	<u>Home Gardening - IV</u>		2	2
	I	Interior Scaping I :Gardening in tubs/urns, Bottle Gardens, Terrariums & Miniature Gardens		
	II	Interior Scaping II: Hanging Baskets, Vertical Gardens, Window Gardens		
UVGHM405	<u>Sustainable Development –II</u>		2	2
	I	Sustainable Development –III		
	II	Sustainable Development –IV		
UVGHM406	<u>Communication Skills-IV And Basics Of Computer –IV</u>		2	2
	I	General Communication Skill - IV		
	II	Basics of Computer – IV		
UVGHMP404-405	Practicals based on theory of General Education Component		6	6

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Semester III UVGHM301	L	Cr
<u>Paper I - Nutrients For Green House Crops</u>	30	2
<u>UNIT I Availability and Absorption of Nutrients and Nitrogen Metabolism</u> <ul style="list-style-type: none"> • Detection, Occurrence and Availability of Essential Elements • Mineral Salt absorption and translocation <ul style="list-style-type: none"> ○ Types of Absorption : passive and active ; ○ Factors affecting salt absorption ○ Translocation • <u>Nitrogen Metabolism</u> <ul style="list-style-type: none"> ○ Nitrogen Nutrition ○ Nutrient cycle (Nitrogen cycle) ○ Biological Nitrogen fixation by Leguminous plants ○ Amino acids and amides ○ Choice of Nitrogen fertilizers and time of application ○ Proteins 	15	
<u>UNIT II Functions and Deficiency Symptoms of Essential Minerals</u> <ul style="list-style-type: none"> • Major and Minor elements required by plants • Functions and Deficiency Symptoms of the following Essential Minerals: Nitrogen, Phosphorus, Calcium, Magnesium, Potassium, Sulphur, Iron, Manganese, Copper, Zinc, Boron, Molybdenum 	15	
		


Semester III UVGHM302	L	Cr
<u>Paper II -- Pollination In Green House</u>	30	2
<u>UNIT I Methods of Pollination in Greenhouse</u> <ul style="list-style-type: none"> • Agents of pollination: Bumble bee, honey bee, ants and man • Commercial pollinating devices : Paint brush, Flicking support strings, Air Movement 	15	
<u>UNIT II Specific Pollination Methods in Greenhouse grown crops</u> <ul style="list-style-type: none"> • Case Study : Tomato, Musk melon, Water melon, Bitter gourd 	15	
		

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Semester III UVGHM303	L	Cr
<u>Paper III -- Organic Fertilizers & Irrigation Systems</u>	30	2
<p><u>UNIT I Naturally occurring organic fertilizers</u></p> <ul style="list-style-type: none"> • Manures, Slurry, Worm castings, Peat, Seaweed, Humic Acid, Guano, Swage, Sludges <p><u>Production of organic Fertilizers</u></p> <ul style="list-style-type: none"> • Compost, Bloodmeal, Bone meal, Humic acid, Sea weed extracts , Natural enzyme digested proteins- Fish meal, Feather meal • Decomposing Crop residue (Green Manure), Vermicompost 	15	
<p><u>UNIT II Types and Components of Irrigation Systems:</u></p> <ul style="list-style-type: none"> • Types of irrigation systems <ul style="list-style-type: none"> ○ large field systems (centre pivot and wheel line), ○ turf ○ vegetable and orchards (flood, spray ,stake, pop-up, drip) ○ greenhouse flood beds and floors, mechanized booms, hanging basket conveyors, mist, and fog systems. ○ Choosing the appropriate system. • Components of irrigation systems: <ul style="list-style-type: none"> ○ Pipes, tubes and fittings, nozzles, solenoid valves, controllers <p><u>Irrigation System Design</u></p> <ul style="list-style-type: none"> • Irrigation system design: flow and pressure. <ul style="list-style-type: none"> ○ Irrigation system design considerations: filters, backflow prevention. ○ On/off control mechanisms, Automated irrigations controllers: (Timers , RH and VPD sensors) ○ Components of a drip system, drip system lay out ,operating drip system/ types, wetting patterns,Benefits • Fertigation systems: Injectors and plumbing; Controlling pH, EC, and pathogens. Determining fertilizer rates, Chemigation • Water quality: alkalinity and solutes. 	15	

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Semester III UVGHM304	L	Cr
<u>Paper IV– Home Gardening - III</u>	30	2
<u>UNIT I Tropical Indoor Plants: Culture and Factors for Growing</u> <ul style="list-style-type: none"> • Understanding interior environments <ul style="list-style-type: none"> ○ Plants for different light conditions ○ Deciding the location of the indoor plant, Managing colour, Using mirrors, Plants in baskets, Miniature gardens • Dealing with indoor plants <ul style="list-style-type: none"> ○ Potting Media, Container selection, Managing plant nutrition, Pruning indoor plants, Factors for growing indoor plants. 	15	
<u>UNIT II Landscaping-II</u> <ul style="list-style-type: none"> ○ Principles ○ Making a landscape ○ Principles of garden designing and garden layout 	15	
		

Semester III UVGHM305	L	Cr
<u>Paper V -- Sustainable Development-I</u>	30	2
<u>UNIT I Sustainable Development I</u> <ul style="list-style-type: none"> • Introduction to sustainable development • Factors affecting sustainable development • Principles of sustainable development • Youth and Women empowerment 	15	
<u>UNIT II Sustainable Development II</u> <ul style="list-style-type: none"> ○ Pollution- Air, Water, Soil ○ Ecological degradation -Agriculture ,Deforestation ○ Green house gas emission ○ Adverse impact of use of fertilizers, pesticides, irrigation & other industries on environment 	15	
		

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Semester III UVGHM306	L	Cr
<u>Paper VI - Communication Skills - III & Basics Of Computers- III</u>	30	2
<u>UNIT I General communication Skill III</u> <ul style="list-style-type: none"> • Preparing for Group Discussions, debates and conferences • Preparing for Presentations • Preparing for Interviews • Making posters, advertisements • Webpage designing • Conducting interviews 	15	
<u>UNIT II Basics of Computers-III</u> <ul style="list-style-type: none"> • Excel Basics : Elements of Electronics Spread Sheet, Manipulation of cells Providing Formulas, Spread sheets for Small accountings • Google drive , Google forms. • IoTs in Greenhouse Management 	15	
		


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	Semester III UVGHMP301	Cr
	PRACTICAL Paper I – Skill Component	4
	Effect of mineral deficiency in plants	
	Identification of specific mineral deficiency symptoms in plants(soil/soilless)	
	Identification of Biological nitrogen fixing organisms.	
	Qualitative tests for protein from various leguminous seeds	
	Comparative Study of growth parameters in different Nitrogenous fertilizers (Project)	
	Semester III UVGHMP302	
	PRACTICAL Paper II – Skill Component	4
	Study of Male and female flowers of cucurbits	
	Pollination in green house	
	Cross pollination and self pollination studies in Tomatoes plants in green house(Count the success of pollination and Identify the pollinating agents)- Project	
	Semester III UVGHMP303	
	PRACTICAL Paper III – Skill Component	4
	Identification of manures & compost	
	Preparation of Organic Fertilizers	
	Analysis of Organic content, pH, WHC of the prepared organic fertilizers	
	Estimation of NPK in the fertilizers using flame photometer.	
	Types and components of irrigation system	
	Field visit and report /assignment submission	
		


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Semester III UVGHMP304		Cr
PRACTICAL PAPER IV- General Education Component		3
	Types of containers for indoor plants	
	Preparation of hanging baskets	
	Miniature gardens and landscapes	
	Growing Orchids and Palms	
	Report on Indoor garden plants	
Semester III UVGHMP305		
PRACTICAL PAPER V- General Education Component		3
	Testing of polluted water sample	
	Testing of soil sample	
	Report on Case study / success story of sustainable development/ youth/ women empowerment	
	Submission: A survey of Tropical Indoor plants.	
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<u>SEMESTER IV</u>		
Semester IV UVGHM401	L	Cr
<u>Paper I -- Soilless Cultivation II</u>	30	2
<u>UNIT I Hydroponics: Commercial Aspects and Recent Advancements</u> <ul style="list-style-type: none"> • Commercial Aspects • Advancements • Hydroponics in Green house • Government Schemes for hydroponics 	15	
<u>UNIT II Hydroponics : Techniques and Media</u> <ul style="list-style-type: none"> • Techniques in Hydroponics – Static solution culture, Continuous –flow Solution culture, NFT, Aeroponics, Passive sub-irrigation, Ebb and flow, Dutchbucket, Deep water culture, Bubbleponics. • Media used for Hydroponics: Clay, Rock wool, cocopeat, Perlite, Pumice, Vermiculite, Sand, Gravel, Hydroton, Polystyrene packing peanuts, wood fibre. 	15	
		


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Semester IV UVGHM402	L	Cr
<u>Paper II –Organic Cultivation Of Green House Crops</u>	30	2
<u>UNIT I Principles and Advantages of Organic cultivation</u> <ul style="list-style-type: none"> • Principles and practices • Importance in modern crop production • Advantages and inconveniences of organic fertilizers • Sikkim - as an organic state 	15	
<u>Methods of Organic Cultivation</u> <ul style="list-style-type: none"> • Planting, managing soil quality, soil fertility management, weed management, diseases and pest control, organic pesticides Organic certification procedure 	15	
		


Semester IV UVGHM403	L	Cr
<u>Paper III -- Propagation, Planting and caring of greenhouse plants</u>	30	2
<u>UNIT I Ornamental Ferns , Foliage Plants & Cacti</u> <ul style="list-style-type: none"> • Propagation, Planting and Caring of green house flowering plants – (Gerbera, Carnation, Rose, Orchid, Marigold, Anthurium) • Propagation, Planting and Caring of ferns(2egs.), foliage plants(2egs), Cacti(2egs) 	15	
<u>UNIT II Fruit crops, Vegetables and Exotic vegetables</u> <ul style="list-style-type: none"> • Preparation of soil ,cultivation , planting and caring of : <ul style="list-style-type: none"> ○ Fruit crops(Strawberry) ○ Vegetables and Exotic vegetables (Three examples each) ○ GGAP(Good Global Agricultural Practices) 	15	
		

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Semester IV UVGHM404	L	Cr
<u>Paper IV -- Home Gardening - IV</u>	30	2
<u>UNIT I Interior Scaping I :</u> Gardening in Tubs or Urns, Bottle Gardens, Terrariums and Miniature Gardens <ul style="list-style-type: none"> • Choice of containers • Choice of media • Making of gardens in tubs, urns, bottles and terrariums, Making of miniature gardens in a dish, pot gardens/ pot rangoli • Internal environment- humidity, ventilation 	15	
<u>UNIT II Interior Scaping II :</u>	15	
<ul style="list-style-type: none"> • Hanging Baskets <ul style="list-style-type: none"> ○ Selecting containers, Preparing hanging baskets, Growing flowers, vegetables and fruits in hanging baskets • Vertical Gardens <ul style="list-style-type: none"> ○ Green walls and their importance, Types of media- Loose media, mat media, structural media, Advantages of vertical gardens • Window Gardens <ul style="list-style-type: none"> ○ Window farming, Choice of containers and light weight media ○ Importance 		
		

Semester IV UVGHM405	L	Cr
<u>Paper V -- Sustainable Development -II</u>	30	2
<u>UNIT I Sustainable Development –III</u> <ul style="list-style-type: none"> • Conservation <ul style="list-style-type: none"> ○ Soil, Water, Biodiversity 	15	
<u>UNIT II Sustainable Development –IV</u> <ul style="list-style-type: none"> • Reducing the use of non-renewable energy sources <ul style="list-style-type: none"> ○ Gobar gas ○ Biocoal 	15	
		


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Semester IV UVGHM406	L	Cr
Paper IV - <u>Communication Skills –VI & Basics of Computer - IV</u>	30	2
<u>UNIT I General Communication Skill- IV</u> <ul style="list-style-type: none">• Planning and writing documents• Summary writing• Understanding Audience speaker relationship• Media Writing	15	
<u>UNIT II Basics of Computer –IV</u> <ul style="list-style-type: none">• Starting e-business• Use of Computers for Business Development and Advertising.• IoTs in Green house Management	15	
		

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	Semester IV UVGHMP401	Cr
	PRACTICAL Paper I – Skill Component	4
	Identification of different techniques in hydroponics	
	Growing the following in Hydroponics solution formulated by you: A leafy vegetable/ a fruity vegetable	
	Growing the following in Hydroponics solution formulated by you: A medicinal herb/aromatic plant	
	Safety measures in a greenhouse	
	Project submission on Expt. No 2/3	
	Semester IV UVGHMP402	
	PRACTICAL Paper II– Skill Component	4
	Study of different weeds in Green House	
	Comparative study of plants grown in organic/inorganic fertilizers (morphological parameters)	
	Study of diseases in Green house plants	
	Study of pests and organic control measures	
	Assignment : Success story – Any organic state	
	Semester IV UVGHMP403	
	PRACTICAL Paper III – Skill Component	4
	Growing of flowering plants in the green house	
	Growing of Ferns and foliage plants in the green house.	
	Growing of Vegetables and exotic vegetables in the green house.	
	Grafting of cacti and monitoring their growth	
	Identification of exotic vegetables and their commercial importance	
	Success story of exotic vegetable cultivation- Report submission	
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Semester IV UVGHMP404		Cr
PRACTICAL PAPER II- General Education Component		3
Preparation and maintenance of		
Hanging baskets		
Miniature gardens		
Vertical Gardens		
Bottle Garden		
Terrarium		
Potgarden /potrangoli		
Report on any one of the above experiments to be submitted at the time of Semester end examination.		
PRACTICAL PAPER II- General Education Component		3
Importance of gobar gas & biocoal		
Preparation of biocoal		
Industry visit and Report submission		
		

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