AC 27/2/13
Item No. 4.12

UNIVERSITY OF MUMBAI

Syllabus for sem V & VI
Program: B.Sc.
Course: Horticulture
Applied Component

(Credit Based Semester and Grading System with effect from the academic year 2013–2014)

T.Y.B.Sc. Applied Component Horticulture Syllabus
Credit Based and Grading System
To be implemented from the Academic year 2013-2014

SEMESTER V

Course Code	UNIT	TOPICS	Credits	L / Week
USACHO501	HORTICULTURE & 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
USACHO5P1	Practicals based on all courses in theory		2	4

SEMESTER VI

Course Code	UNIT	TOPICS	Credits	L / Week
USACHO601	HORTICULTURE & 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
USBO6P1	Practicals based on all the courses in theory		2	4

SEMESTER V
THEORY

Course Code	Title	Credits
USACHO501	HORTICULTURE AND GARDENING –I	2 Credits (60 lectures)

Unit 1 INTRODUCTION TO HORTICULTURE — 15 L

- 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
  - o Konkan Krishi Vidyapeeth – Dapoli
  - o National Research Centre for grapes.
  - o Regional Fruit Research centre Pune
  - o Horticulture Training Centre (H.T.C.) – Talegaon.
  - o Central Potato Tuber Research Institute (CPTRI) – Shimla
- Horticulture Consultancy
- Strategy plantation – Lakhibaug Yojana

Unit 2 PROPAGATION PRACTICES — 15 L

- By Seeds
  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.
- By specialized Vegetative structures
  Bulbs, Tubers, Corms, Rhizomes, Root stock, runners, Offsets and suckers.
- Artificial methods of plant propagation
  - o Cutting– Root cutting, Stem cuttings, and leaf cuttings. Use of PGR's for rooting.
  - o Layering – Definition, Types: Simple, compound, (Serpentine) Tip, Trench, Mound, Air Layering.
  - o Grafting-Definition, advantages and disadvantages. Types: Splice, Whip/ Tongue, side, veneer, cleft, bark, epicotyls, approach, repair grafting – enarching, bridge and bracing.
  - o Budding – Definition, advantages and disadvantages. Types: T-budding, shield, patch , ring budding.
  - o Developing new varieties: Technique of Emasculation and bagging, role of polyploidy n production of seedless varieties in

plants. • Application of Tissue Culture in relation to Horticulture.	
UNIT-3 MAURES, FERTILIZERS AND DISEASES • Manures: Definition, importance, important manures FYM(compost), oil cakes, green manure, organic manures and vermicompost. • Fertilizers: Definition, Types – Straight, Compound and mixed. Nitrogenous (NH4)2 SO4, Urea, Ca (NO3)2, NH4Cl, Phosphatic (Superphosphate, Bone meal), Potassic (Muriate of potash, K2SO4 • Biofertilizers: Bacteria, Cyanobacteria, Mycorrhiza, Sea weeds. • Diseases: Horticultural plant diseases 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, beetle, stem borer, caterpillars and rats. • Friends of farmers: Eartworm, snakes and predaceous fungi.	15 L
UNIT 4 GARDEN OPERATIONS FOR HORTICULTURE • 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. • Organic Farming Definition, Scope, Indian scenario, Future scope	15 L

Practicals

Semester V USACHO5P1	Cr
PRACTICAL	2
Garden implements and their uses .	
Different types of pots & Potting medium , Potting and repotting	
Propagation practices by seed, Vegetative propagation , cutting ,layering , budding, grafting	
Identification of :	

	Fertilizers – Identification by physical and chemical methods –Urea , Ammonium sulphate , Potassium sulphate, super phosphate . Manures – Identification of plants as green manure – *Glyricidia , Crotolaria, Leucaena* . Biofertilizers – Identification (material as slides) VAM, *Nostoc ,Rhizobium* . Soil pH, Use of soil testing Kit, electrical conductivity, pH of water, liquid fertilizers . Method of preparing bonsai, Bottle Garden / Terrarium, Hanging baskets ,Dish garden . 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 . Non Insects pests- Nematodes, Rodents. Preparation of natural insecticides – Neem arka , Dashparni arka, Seetaphal powder, Tobacco extracts . Project – Each student should individually present a project related to any topic related to Horticulture .It should be duly certified presented at practical examination.Project presentation college at level compulsory.	

SEMESTER VI
THEORY

Course Code	Title	Credits
USACHO601	HORTICULTURE AND GARDENING –II	2 Credits (60 lectures)
Unit 1 LANDSCAPE GARDENING • Principles of landscaping & garden design. • Indoor plants & Indoor gardens- Hydroponics, Terrarium/ Bottle garden,		15 L

Dish garden. • Important garden features- Paths & Avenues, Hedges & Edges, Lawn, Flowerbeds, Arches& Pergolas, Fencing, Water bodies, Rock garden & Plants suitable for different locations & climates. • Lawn- Purpose of preparation of lawn, Method of preparation of lawn & management of lawn & lawn plants. • Soil manipulation for plantation of desirable varieties. • Mughal, Buddist, Botanical garden, Vertical wall garden & Theme park • Important Gardens of India—Shalimar (Shrinagar), Vrindavan(Mysore), Veer Jijamata Udyan(Mumbai)	
Unit 2 - HORTICULTURE PRODUCE • High –tech Horticultural production- Green house technology- Meaning, types, layout & construction, irrigation systems. Care & attention. Hardening of plants. Space gardens. • Floriculture – Scope & importance, soil and climatic requirement and cultivation practices and Economics of green house production of Gerbera, Carnation, Roses, Orchids. Propagation techniques, packing and marketing, enhancing and delaying period of bloom by special methods. Floral decoration, Florist shop management.	15 L
UNIT-3 COMMERCIAL PRODUCTION • Commercial production of the following in relation to propagation, post plantation care, harvesting, post harvest management & varieties. o Tubers- potato o Vegetables- Tomato o Fruits- Mango, Grapes & Coconut- products like coco peat/ Coir etc. o Spices/condiments- chilly o Medicinal plants- *Aloe vera*, *Stevia rebaurdina*(Madura) o Aromatic plant- *Citronella*, Patchouli	15 L
UNIT 4 POST HARVEST TECHNOLOGY & ENTREPRENEURSHIP IN HORTICULTURE • 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	15 L

• Fruit & vegetables preservation technology. • Marketing- grading, packing & 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.	

Practicals

Semester VI USACHO6P1	Cr
PRACTICAL	2
Preparation of garden layout	
List of plants suitable for garden locations- 2-3 plants for each location .	
Identification of important horticultural plants 1. Herbs – foliage any 2 and flowering any 2 2. Shrubs – foliage any 2 flowering any 2 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	
Flower arrangements –Indian (Gajara , veni, garland , bouquet - Baskets , hand ,torch type , table floral arrangement), Japanese and western all type	
Preparation of Jams, Jellies, Squashes/ Syrups, Pickle, sauces	
Fruit & vegetable carving & Bio-jewelery	
Green house plants- Information regarding to soil, temperature, irrigation, fertilizer requirements and propagation methods for *Anthurium, Gerbera*, Orchids, Tuberose, Carnation, Roses, *Capsicum*	

	Preparation of garden layout	
	List of plants suitable for garden locations- 2-3 plants for each location .	

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

Modality of Assessment :

Theory Examination Pattern:

A) Internal Assessment - 40% 40 marks.

Theory **40 marks**

Sr No	Evaluation type	Marks
1	One Assignments/Case study/Project	10
2	One class Test (multiple choice questions / objective)	20
3	Active participation in routine class instructional deliveries(case studies/ seminars//presentation)	05
4	Overall conduct as a responsible student, manners, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.	05

B) External examination - 60 %

Semester End Theory Assessment - 60% 60 marks

i. Duration - These examinations shall be of two hours duration. Theory question
ii. paper pattern :- There shall be five questions each of 12 marks. On each unit there
1 will be one question & fifth one will be based on all the four units . All questions
. shall be compulsory with internal choice within the questions. Each question will
2 be of 24 marks with options. Questions may be sub divided into sub questions a, b,
. c & d only, each carrying six marks OR a, b, c, d,e & f only each carrying four marks
3 and the allocation of marks depends on the weightage of the topic.

Practical Examination Pattern:

(A)Internal Examination:-

There will not be any internal examination/ evaluation for practicals.

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

Sr.No.	Particulars	Marks
1.	Laboratory work	80
2.	Journal	10
3.	Viva	10

Assessment pattern for semester end / External practical examination of 80 marks shall be finalized in the workshop of the subject

Semester end practical examination in applied component shall be conducted by the concerned department of the Institute/ College at the end of each semester and the marks of the candidates are to be sent to the University in the prescribed format.

Semester V:

Practical examination will be held at the college / institution at the end of the semester.

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 of the Department/ Co-ordinator of the department ; failing which the student will not be allowed to appear for the practical examination. Semester VI Practical examination will be held at the college / institution at the end of the semester. 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 of the Department/ Co-ordinator of the department ; failing which the student will not be allowed to appear for the practical examination.