

Karmaveer Bhaurao Patil University, Satara
Yashavantrao Chavan Institute of Science,
Satara
(Autonomous)

Syllabus under Autonomy
For
Diploma-I

Academic Year 2024 - 2025

Department of Botany

Revised Syllabus of Diploma Courses (UG)

Preamble:

The Certificate Course in Horticulture under autonomy will be effective from the academic year 2023 – 2024. Horticulture plays a pivotal role in the food and livelihood security of India. Economists view that commercialization of agriculture and promotion of agri- business in India is correlated to the progress in the plantation and horticulture sectors. Horticulture and Plantation sector cover production, post-harvest management, marketing, processing and export of produce. The syllabus has been prepared keeping in view the unique requirements of the horticulture-based industries and society. The emphasis of the contents is to provide students the latest information of application of horticulture with the aim of disseminating skills of entrepreneurship. The Private sector has come up with massive investments in corporate farming, processing and marketing. The course content also lists new practical exercises so the students get a hands on experience of the latest techniques that are currently in use. The course will also inspire students towards becoming an entrepreneur and enable students to get employed in plant-based industries

Program Objectives of the Course:

1. To inculcate the importance of studying horticultural practices and usage of horticultural crops.
2. To equip the students with practical knowledge of different horticultural practices.
3. To familiarize the students with the horticulture-based industries at national and international level.
4. To impart the basic skills of entrepreneurship in the students specifically in the field of horticulture.

Program Outcomes:

1. Transfer knowledge of Agriculture/Horticulture in the field of agricultural research especially in horticulture including fruits, vegetables, flowers, spices, medicinal and aromatic plants and their management.
2. Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
3. Increase farmers' income through adopting hi-tech horticulture.
4. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.
5. Conservation and exploitation of biological diversity through crop management.
6. Prolong the post-harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post-harvest losses.

Diploma -I

1. **Title:** Horticultural Practices
2. **Year of Implementation:** 2024-25
3. **Duration:** One Year
4. **Pattern:** Semester
5. **Medium of Instruction:** English
6. **Contact hours:** 7 hours/w
8. **Structure of Course:**

Syllabus Structure (UG)

Year	Semester	Course No.	Course Code	Contact Hours	Credits (1Credit=15 H)	Total Marks
1	I	CT I	DBT 101	30	2	75
		CL I	DB L101	60	2	75
	II	CT II	DBT 202	30	2	75
		CL II	DB L202	60	2	75
	Annual	CP I	DBP101	30	1	50
	Total			210	9	350
2	III	CT III	DBT 303	30	2	75
		CL III	DB L303	60	2	75
	IV	CT IV	DBT 404	30	2	75
		CL IV	DB L404	60	2	75
	Annual	CP II	DBP202	30	1	50
	Industrial and or Incubation and or Research and or Field Training			30	1	-
	Total			240	10	350
3	V	CT V	DBT 505	30	2	75
		CLV	DBL505	60	2	75
	VI	CT VI	DBT 606	30	2	75
		CL VI	DBL606	60	2	75
	Annual	CP III	DBP303	60	2	100
	Industrial and or Incubation and or Research and or Field Training			30	1	-
Total			270	11	400	
Total				720	30	1100

Total No. of Papers: 15 (Theory:6, Practical:6, Project:3)

Theory and Practical: Semester, Project: Annual

PT: Paper Theory, PL: Paper Lab, PP: Paper Project, D: Diploma, * : Name of Subject,

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Syllabus to be introduced from June 2024

Diploma-I

Semester I

DBT 101: Principles of Horticulture and Plant Propagation-I

(Contact Hrs: 30 Credits: 2)

Course Objectives: The students should be able to.....

1. Know the scope of the horticulture.
2. Know the use of plant propagating media.
3. Know garden Tools and Implements
4. Know application of fertilizer

Unit	Principles of Horticulture and Plant Propagation-I	No. of hours per unit/credits
Unit I	Principles of Horticulture	18
	<p>1.1 Introduction: Concept, Objectives, Branches of Horticulture, Carrier opportunities in the horticulture.</p> <p>1.2 Garden Tools and Implements: Axe, crowbar, Hoe, Hosepipe, knives, labels, Lawnmower, Pickaxe, pruning shear, Saw, Secateurs, Sieve, spade and Shovel, Sprinklers / rainbirds, Sickle, Sword, Trowel, Watering can, pots / containers.</p> <p>1.3 Soil and its preparation: Physical texture and composition of soil, soil types, soil pH, preparation of beds and preparation of soil mixtures / garden soil.</p> <p>1.4 Fertilizers, Organic Manures and Substrates: Fertilizers; Farmyard manure, compost, leaf mold, bone meal, Oilcakes, wood ash, charcoal, peat moss, <i>Sphagnum</i> Moss, shredded bark, Sawdust, and wood shavings; vermiculite, Vermicompost.</p> <p>1.5 Potting, Repotting and Transplantation: Types of pots, Plants suitable for pot culture, potting, repotting, Transplantation.</p> <p>1.6 Pruning: Introduction, objectives; Types and season of pruning, special pruning techniques, differential pruning technique,</p>	

	<p>pruning of flowering and fruit plants</p> <p>1.7.Training: Introduction, systems of pruning-leader and modified leader systems, training of plants requiring support of Structures, training of plants do not requiring support of Structures,training of ornamental plants</p>	
Unit II	Introduction to Horticultural Plants	12
	<p>2.1 Taxonomy: Concept of Taxonomy, Nomenclature and Classification</p> <p>2.2: Classification of Horticultural crops: classification on the basis of growth habit, shedding of leaves, life span, climatic requirement, use of plant part, ecology</p> <p>2.3 Types of Horticultural Plants: Annuals, Perennials, climbers, shrubs and trees (at least two examples with morphology and horticultural use and applications from each type).</p>	

Course Outcomes: *The students will be able to.....*

1. Explain the importance and scope of horticulture.
2. Explain the concepts in taxonomy of horticultural.
3. Acquire the knowledge about application of fertilizers
5. Know how to use garden Tools and Implements

Reference Books:

1. Aldhous JR (1972) Nursery practices [R]. Forestry Commission Bulletin No. 43.London: Page Bro Ltd. Pp. 184.
2. Andre G (1994) Application of Botany in Horticulture. Science Publishers, USA
3. Arora JS (2014) Introductory Ornamental Horticulture. Kalyani Publishers, New Delhi
4. Augé R, Vidalie H (1995) In Vitro Culture and Its Applications in Horticulture. SciencePublishers Incorporated, USA
5. Bhojwani SS, Razdan MK (1996) Plant tissue culture: Theory and Practice. Revised edition,Elsvier, Amsterdam.

Semester-I

DB L101: (Practical)

(Contact Hrs: 60 Credits: 02)

Course Objectives: The students should be able to.....

1. Know the scope of the horticulture.
2. Know the use of plant propagating media.
3. Explain the importance and scope of horticulture
4. Define concepts in horticulture.

Section	Principles of Horticulture and Plant Propagation I	No. of hours per unit/ credits
Section-I	1.Study of Garden Tools and Implements. 2-3. Study of soil texture and pH. 3-4. Study of fertilizers. organic manures & substrates. 5-6. Preparation of soil mixture for potting and pots. 7-9. Demonstration of Potting, repotting & transplantation. 10-11. Demonstration of Pruning and training techniques. 12-15. Study of Horticultural Crops.	

Course Outcomes: The students will be able to.....

1. Identify tools used in horticulture.
2. Identify different types of soil texture and pH of soil. Practical Identify different types of fertilizers used in horticulture.
3. Prepare soil mixtures for potting.
4. Learn potting, reporting and transplantation.

Reference Books:

1. Aldhous JR (1972) Nursery practices [R]. Forestry Commission Bulletin No. 43. London: Page Bro Ltd. Pp. 184.
2. Andre G (1994) Application of Botany in Horticulture. Science Publishers, USA
3. Arora JS (2014) Introductory Ornamental Horticulture. Kalyani Publishers, New Delhi
4. Augé R, Vidalie H (1995) In Vitro Culture and Its Applications in Horticulture. SciencePublishers Incorporated, USA
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Diploma-I

Semester II

DBT 202: Principles of Horticulture and Plant Propagation II

(Contact Hrs: 30 Credits: 2)

Course Objectives: The students should be able to.....

1. Know the sowing of seeds and plant cuttings in different media.
2. Know preparation of nursery seed beds
3. Know different types of plant propagation
4. Know about nursery management

Unit	Principles of Horticulture and Plant Propagation II	No. of hours per unit/credits
	Plant Propagation	
Unit I	<p>1.1. Introduction: Concept and history of plant propagation, Classifications of plant propagation methods, Choice of propagation methods.</p> <p>1.2. Propagating Structures, Equipment's and Media: Concepts, Green house, Shade house, Net-house, Hot beds, Cold frame, Mist propagating units, containers for growing plants/seedlings/saplings; Rooting media- Soil, Sand, Vermiculite, Perlite, Sphagnum moss, Leaf mould, Care of media.</p> <p>1.3 Sexual Propagation / Seed Propagation: Concept, advantages, disadvantages, seed germination, seed dormancy, viability of seed, seed health, Pre-germination treatments, growing of seedlings in bed</p> <p>1.4. Asexual Propagation / vegetative propagation: Concept, advantages, disadvantages / limitations; propagation by specialized vegetative structures (Bulb, Tubers, root, stem corm, Rhizome, runner, offset, suckers etc.); Types of propagation- Cutting, layering, grafting, and budding</p>	18

	<p>1.5 Micropropagation: Overview of tissue culture and micropropagation- Requirement for micropropagation, Establishment, multiplication, root formation, Acclimatization;</p> <p>1.6. Methods of micropropagation: Meristem culture, embryo culture, anther culture, axillary bud culture; Merits, limitations and applications of micropropagation</p>	
Unit II	Nursery Management	12
	<p>2.1. Basics of nursery management: Present status of nurseries and planting material, Propagules for different horticultural crops, Technical Knowledge, Nursery Registration, Linkages, Finance, Hi-tech interventions, Marketing management, types of nursery, infrastructure and requirements</p> <p>2.2. Layout of a model nursery: Fencing, Roads and paths, Progeny block/ Mother plant block, Irrigation system, Office cum store, Seed beds, Nursery beds, Propagation structures, Potting mixture and potting yard, packing yard, Compost unit</p> <p>2.3. Preliminary considerations for production of quality planting material: Identification of potential areas and production targets, Selection of location and site, develop flow chart of various nursery practices, Labelling of planting material, Requirements of inputs, Verification of specification standards, Maintenance of nursery records, Labelling of planting material progeny trees / mother plants and Criteria for selection of mother plants;</p> <p>2.3. Nursery management practices: Mulching, Manuring, Irrigation, Hoeing and weeding, Removal of polythene strip, De-shooting, Staking, Single stemming, Uprooting and packing of plants, manures and fertilizer, Plant Protection; commercial importance</p>	

Course Outcomes: The students will be able to.....

1. identify propagating structures, equipment's used in plant propagation and different types of media used for propagation.
2. test the viability of seeds.
3. learn different types of seed dormancy and techniques to break the dormancy.

- 4.learn the different methods of vegetative propagation like cutting,layering, budding and grafting.
- 5.preparation of micropropagation media and in vitro propagationmethods.

Reference Books:

1. Duryea ML (1984) Nursery cultural practices: Impacts on seedling quality. In forest nursery manual: Production of Bareroot seedlings. Duryea ML and Thomas, DL (eds.) Martinus Nijhoff/Dr W. Junk publishers. The Hauge/Boston/Lancaster, for forest research laboratory, Oregon State University. Corvallis.
2. Heit CE (1967) Propagation from seed: 8. Fall planting of fruit and hardwood seeds. American Nurseryman 126(4):12-13, 85-90.
3. Kaul GL (1989) Horticulture crop in India.
4. Razdan, MK (1995) An Introduction to Plant Tissue Culture. Oxford and IBH publishing Co. Pvt. Ltd. New Delhi. pp 27-91.
5. Singh SP (1990) Advances in Horticulture and Forestry. Scientific Publishers, New Delhi

DB L202: (Practical)

(Contact Hrs: 60 Credits: 02)

Course Objectives: The students should be able to.....

1. Identify tools used in horticulture.
2. Identify different types soil texture and pH of soil.
3. Identify different types of fertilizers used in horticulture
4. Prepare soil mixtures for potting.

Section	Principles of Horticulture and Plant Propagation II	No. of hours per unit/ credits
Section-I		
	1-2. Study of propagating structures, equipment's and media. 3.To study the seed viability using different techniques. 4-5. Study of methods to break seed dormancy. 6-7. Study of vegetative propagation methods. 8.Micro-propagation by axillary bud culture 9-10.Study of model nursery and irrigation system in nursery. 11.Preparation of beds for raising seedlings. 12-13. Study of mulching and manuring in nursery. 14.Study of uprooting and packaging of nursery plantlets. 15.Study of plant protection methods in nursery	

Course Outcomes: The students will be able to.....

1. identify propagating structures, equipment's used in plantpropagation and different types of media used for propagation.
2. test the viability of seeds.
3. learn different types of seed dormancy and techniques to break the dormancy.
4. learn the different methods of vegetative propagation like cutting, layering, budding and grafting.

Reference Books:

1. Duryea ML (1984) Nursery cultural practices: Impacts on seedling quality. In forest nursery manual: Production of Bareroot seedlings. Duryea ML and Thomas, DL (eds.) Martinus W. Junk publishers. The Hauge/Boston/Lancaster, for forest research laboratory, Oregon

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5. Singh SP (1990) Advances in Horticulture and Forestry. Scientific Publishers, New Delhi.

BOS Sub-Committee

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|---------------------|----------|
| 1. Dr. N. B. Mane | Chairman |
| 2. Mr. S. M. Gojare | Member |

Expert Committee

- 1 Mr. Ajit Jadhav- Floriculturist, Satara -Name of Industrial Expert
- 2 Dr. Yadgirwar B. M – Subject matter specialist, Borgaon Kristin Vigyan Kendra, Borgaon -
Name of Academic Expert