

**Certificate course on  
BOT1MAT: Modern Agricultural Technology**

**Coordinator: Dr. Deepa P.**

**Duration: 30 hours**

**Module I**

A) Basics of Horticulture

1. Concept and scope of Horticulture

2. Basic requirements – Soil & soil components, soil testing, implements and irrigation methods

B) Garden and Nursery management

3. Types of garden (a brief account) - Rock garden, Roof garden, Bonsai, Kitchen garden, Orchard, Garden ponds

4. Sexual Propagation

i) Seed propagation, seed storage, seed dormancy, seed germination

ii) Seed treatment and seed viability test.

5. Artificial vegetative propagation

i) Cutting - Stem, root and leaf cuttings.

ii) Layering - Simple and Air layering

iii) Grafting - Whip/tongue grafting, Approach grafting, Cleft grafting, Epicotyl grafting.

iv) Budding - T-budding, Patch budding

**Module II**

C) Protection and management of gardens

6. Chemical and organic pesticides

D) Basics of micro propagation

7. Basic aspect of Plant tissue culture: History, sterilization, different media components, growth regulators and growth retardants

8. Methods of plant multiplication: *In vitro*-basic parameters for propagation, Explant, Nutrient Medium, Culture environment, Inoculation, Induction of callus, Organogenesis from callus - Importance of micro propagation

E) Mushroom Cultivation training

9. Spawn preparation, mushroom budding, sterilization of substratum, mushroom harvesting and nutrition contents

**Practical**

Determination of soil P<sup>H</sup> and soil texture.

Measurement of weather parameters: Rain, temperature and humidity  
Visit to aesthetic / horticultural gardens / institutions  
Students should be familiarized with different types of budding, grafting and layering  
Setting up of drip irrigation in gardens  
Field visit  
Preparation of organic pesticides and fungicides for field application  
Preparation of stock solution of different media  
Preparation of solid and liquid media  
Sterilization techniques of glass wares, metal instruments, media and explants  
Student should be familiarize with selection of explants, sterilization and inoculation  
Demonstration of inoculation  
Mushroom cultivation

## References

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2. Hand book of Horticulture: ICAR' ICAR - New Delhi, 2002
3. Applied Plant Biotechnology: S Ignasimuthu, Tata Magrow Hill Publishers New Delhi, 1996.
4. Biotechnology: Trehan Keshav, Wiley Earten Ltd
5. A text book of Biotechnology: Dubey R.C, S.Chand and Company, 1995.
6. Plant Propagation : Sadhu M. K., New age intemational publishers, New Delhi, 1996.
7. Fundamentals of Horticulture: J.B. Edmond et al., Tala-Mac-Grow Hill Publishing, New Delhi, 1977.
8. Ornamental Horticultre: Vishnu Swamp, Macmillan India Ltd, 1997.
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10. Plant tissue culture : M.K.Razdan, Oxford publishing, New Delhi, 2003.
11. Plant cell Tissue and organ culture : O. L. Gamborg & G. C. Philips, Narosa Publishing house, New Delhi, 1996.
12. Floriculture in India G.S Randhava: Allied publishers limited, New Delhi, 1986.
13. Floriculture in India: A Mukhopadhyay, Floriculture in India, Allied publishers limited, New Delhi, 1986.
14. Plant cell, Tissue and Organ culture : J. Reinert and YPS Bajaj, Narosa Publishing House, New Delhi, 1997.
15. Vegetative propagation of plants: K. K. Nandha and V. K. Kochar, Kallyani Publisher, New Delhi, 1996.