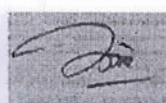
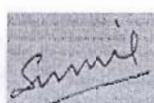
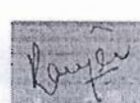
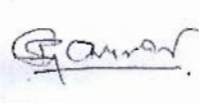
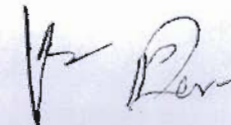
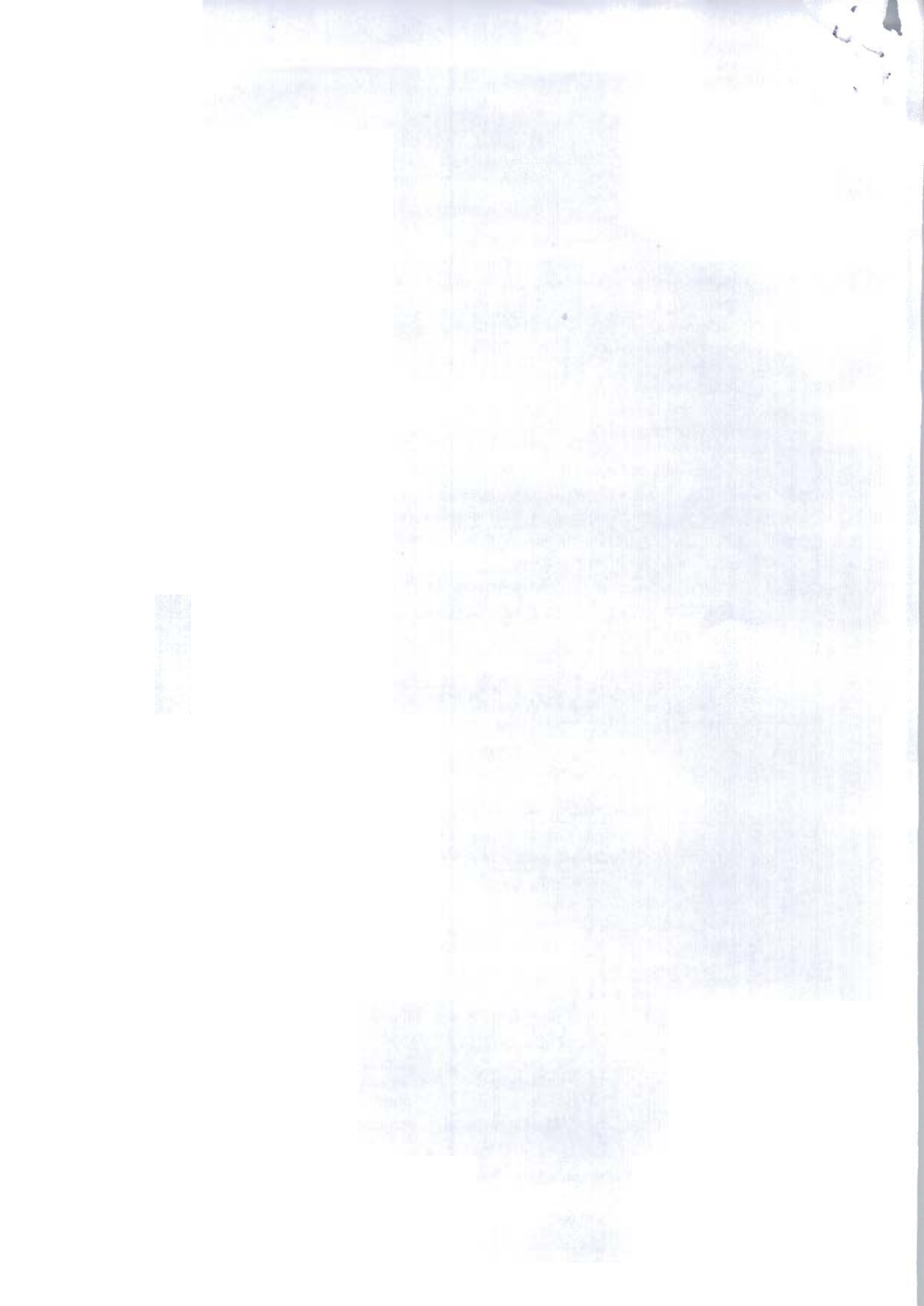


**Pre-Ph.D. Course I**

<b>Subject: Horticulture</b>		
Course Code: -----	<b>Course Title: Advances in Horticultural Research</b>	Theory paper
<p><b>Course Objectives:</b> The main objectives of this paper are to</p> <ol style="list-style-type: none"> <li>1. Impart comprehensive knowledge to the students on importance, scope and present scenario of horticulture in India.</li> <li>2. Provide advance knowledge to the students on propagation and nursery management, organic farming and INM practices used in horticultural research.</li> <li>3. Acquaint with the role of plant growth regulators and importance of protected structures in horticulture.</li> <li>4. Teach about processing &amp; presentation of data and experimental designs used in horticultural experimental research work.</li> </ol> <p><b>Course Outcomes:</b> At the end of this course, the students would be able to:</p> <p><b>CO1:</b> Appreciate the contribution of horticulture in national economy.</p> <p><b>CO2:</b> A thorough understanding of propagation and nursery management, organic farming and integrated nutrient management (INM) practices used in horticultural research</p> <p><b>CO3:</b> Acquire knowledge about the role of plant growth regulators and importance of protected structures in horticulture</p> <p><b>CO4:</b> Understand processing and presentation of data and experimental designs used in horticultural research work.</p>		
<b>Credits: 4</b>		<b>Core Compulsory</b>
Max. Marks: 100		Min. Pass Marks:55
<b>Total No. of Lectures-Tutorial (in hours per week): L-T-P: 4-0-0</b>		
Unit	Topics	No. of Lectures (Total sum = 60)
<b>I</b>	Introduction and contribution of horticulture in national economy	6
	Soil and climatic requirement of Horticultural crops	6
<b>II</b>	Propagation, Mode of propagation, Seed, types of seeds, germination process of seed, Factors affecting seed germination, Asexual propagation methods (cutting, layering, budding, grafting etc.), Scion and root stock. Advantages and disadvantages of sexual and asexual propagation methods.	6
	Nursery, Types and benefits of nursery, Nursery Raising and Management	6
<b>III</b>	Need and present status of organic farming in India, Objectives of organic farming, National programme for organic production, Principles and features of organic farming, Organic Farming in Horticulture	6
	Integrated Nutrient Management, Principles of Integrated Nutrient Management, Components of Integrated Nutrient Management (Chemical fertilizers, Organic manures, Green manures, Legumes crops, Crop residues and Bio-fertilizers)	6





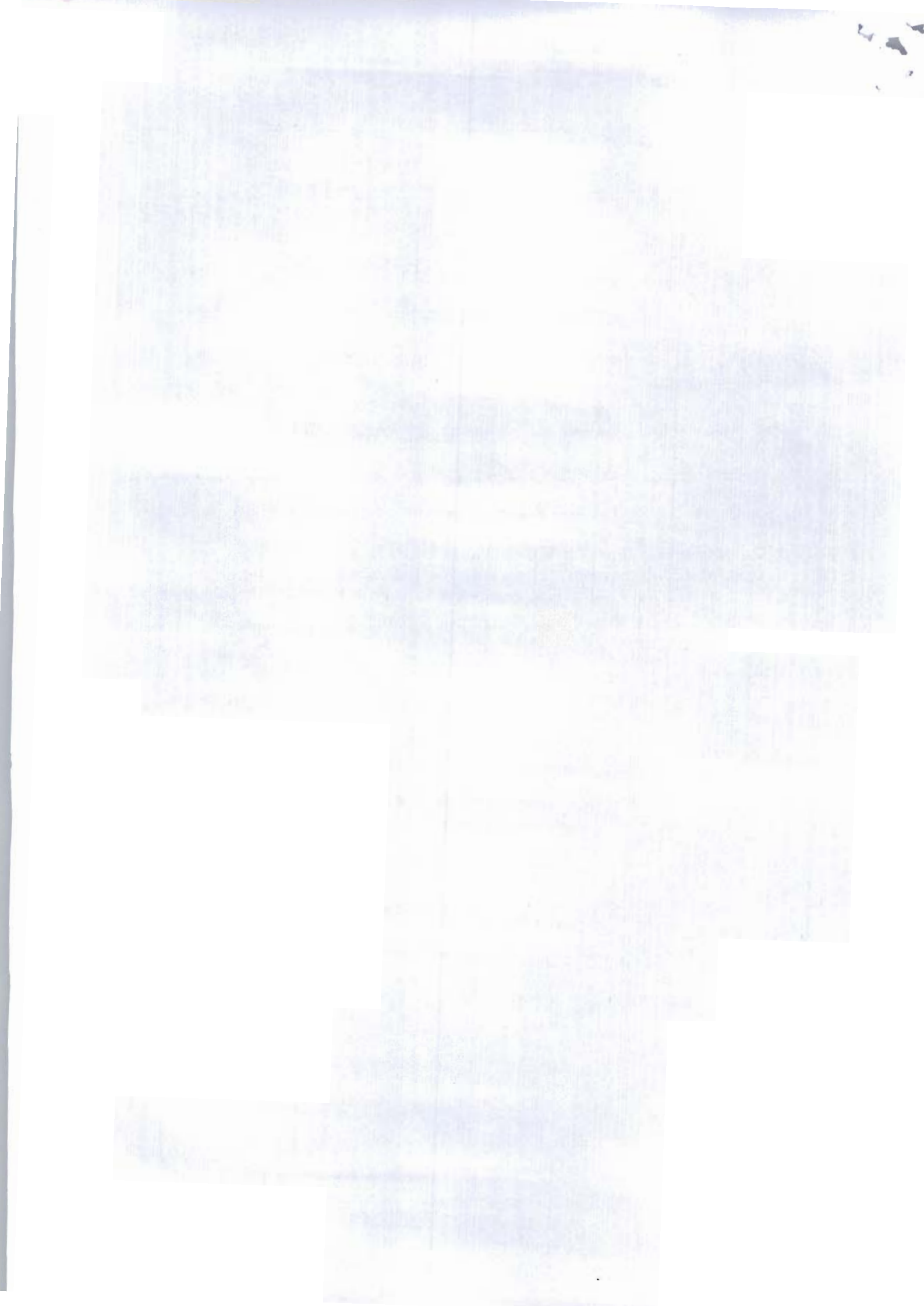
IV	Role of plant growth regulators in horticultural crops	6
	Type of protected structures, Methods used to control environment in protected structures	6
V	Diagrammatic and graphical representation of data bars, histogram, frequency curves and polygon	6
	Basic principle of experimental designs, completely randomized design (CRD), randomized block design (RBD), Latin square design (LSD) etc.	6

**Teaching Learning Process:**

1. Classroom lectures by using ICT tools (Black board/ Whiteboard/ Projector/Smart LED/demonstration)
1. Assignment
2. Student presentation
3. Field visit
4. Group discussion

**Suggested Readings:**

1. Yadav, S.; Pandey, A.; Lal, M. and Kumar, D. *Recent Advances in Horticulture*. Rubicon Publications. 2022
2. Singh, J (Ed.). *Advances in Horticultural Crops*. Weser Books.2018
3. Bijalwan, A. *Advances in Horticulture Science Research*. Intelliz Press. 2016
4. Chadha, K.L. and Pareek, O.P. *Advances in horticulture*. Vol. IV. Malhotra Publ. House. 1996
5. Ireland C. *Experimental Statistics for Agriculture and Horticulture*. CABI. 2010.

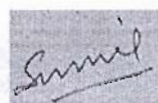
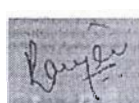
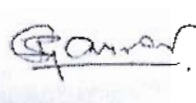




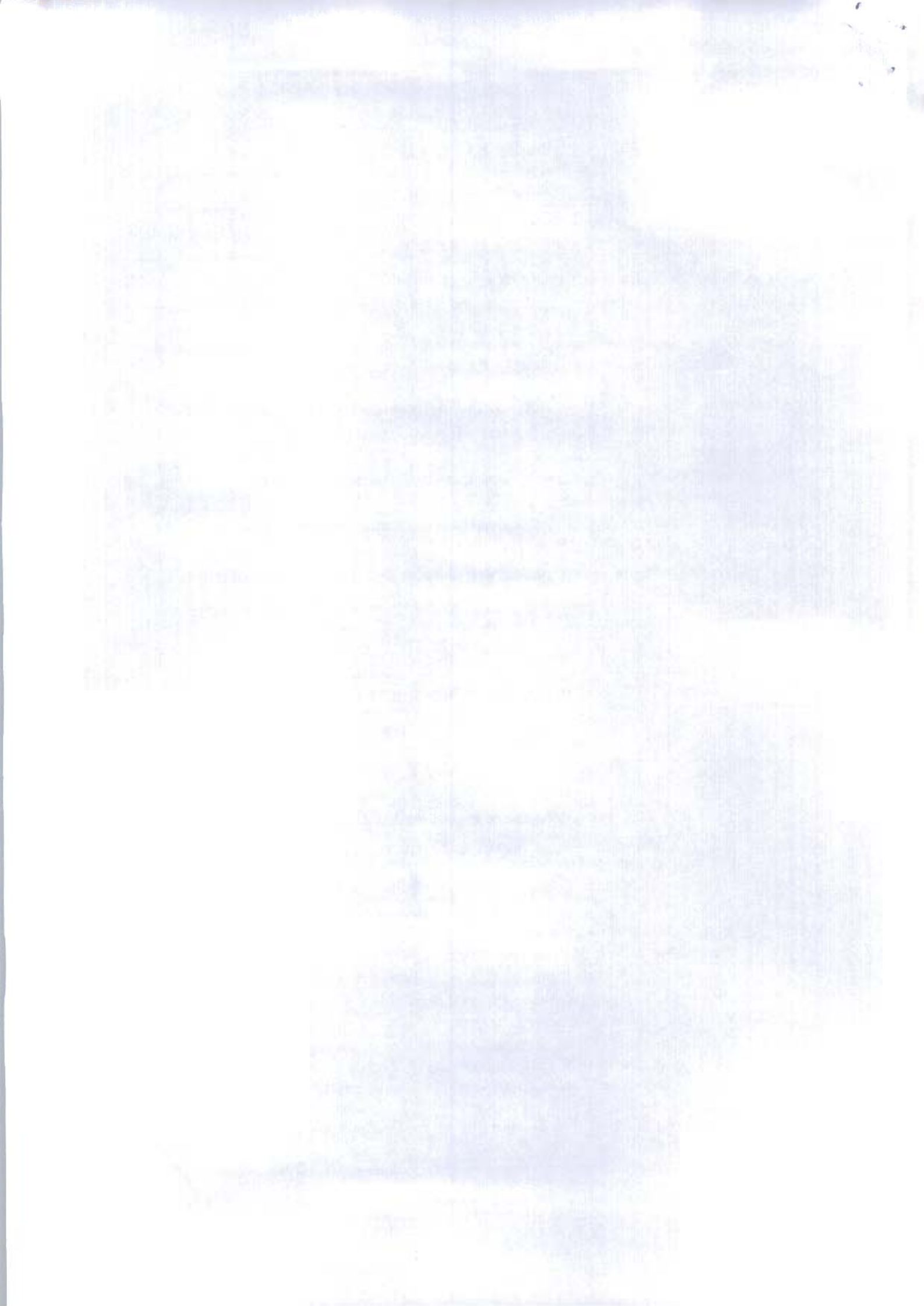
**Pre-Ph.D. Course II**

<b>Subject: Horticulture</b>		
Course Code: ----	<b>Course Title: Postharvest Management of Horticultural Crops</b>	Theory paper
<p><b>Course Objectives:</b> The main objectives of this paper are to</p> <ol style="list-style-type: none"> <li>1. Facilitate deeper understanding of principles and practices used in postharvest management of horticultural crops.</li> <li>2. Acquaint the student with proper handling and management technologies of horticultural crops for minimizing the post-harvest losses.</li> </ol>		
<p><b>Course Outcomes:</b> After successful completion of this course, the students are expected to:</p> <p>CO1: Appreciate the importance and scope of postharvest technology of horticultural produce in India.</p> <p>CO2: Acquire knowledge about pre and postharvest treatments for extending shelf life of horticultural crops.</p> <p>CO3: A thorough understanding of maturity indices and methods of harvesting.</p> <p>CO4: Acquire knowledge about the value addition in loose and cut flowers.</p> <p>CO5: Understand about storage and postharvest diseases and disorders of horticultural crops.</p>		
<b>Credits: 4</b>		<b>Core Compulsory</b>
Max. Marks: 100		Min. Pass Marks:55
<b>Total No. of Lectures-Tutorial (in hours per week): L-T-P: 4-0-0</b>		
Unit	Topics	No. of Lectures (Total sum = 60)
<b>I</b>	Importance and scope of postharvest management of horticultural crops.	6
	Pre and postharvest factors related to post harvest deterioration of horticultural crops	6
<b>II</b>	Maturity indices for harvesting, Time and methods of harvesting	6
	Hastening and delaying ripening process in fruits	6
<b>III</b>	Physiological and biological changes occur during and after maturity in horticultural crops	6
	Pre and postharvest treatment of horticultural crops	6
<b>IV</b>	Treatments prior to shipment, viz., chlorination, waxing, chemicals, biocontrol agents and natural plant products.	6
	Value addition in loose and cut flowers	6
<b>V</b>	Types of storage: Traditional structures (low-cost structures), Zero energy cool chamber (ZECC), Cold storage (Refrigerated storage), Hypobaric storage, Controlled atmospheric storage and Modified atmospheric storage.	6
	Postharvest diseases and disorders of major fruit and vegetable crops viz. apple, mango, banana, cauliflower, potato and tomato.	6





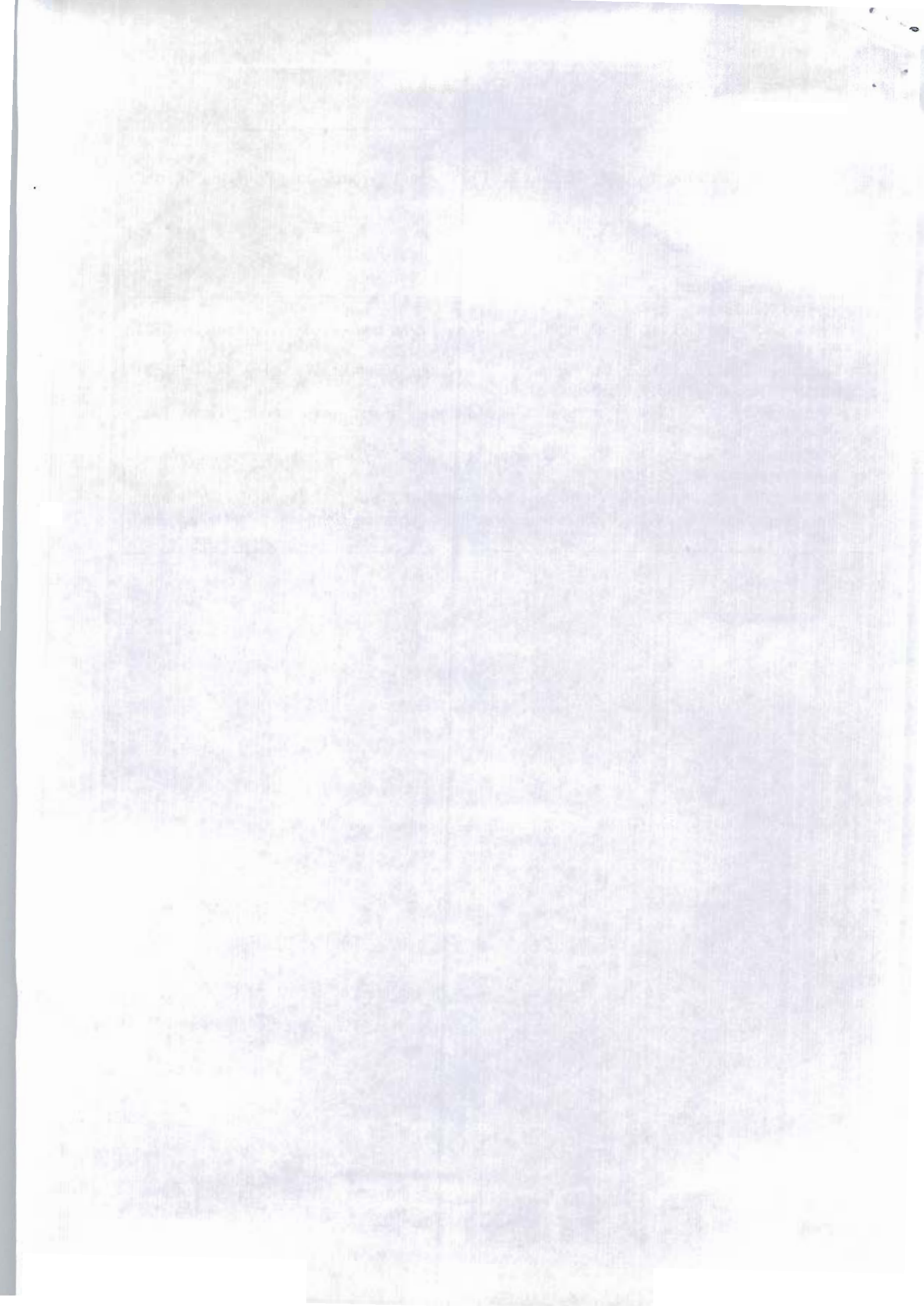
**Teaching Learning Process:**

2. Classroom lectures by using ICT tools (Black board/ Whiteboard/ Projector/Smart LED/demonstration)
5. Assignment (written and speaking)
6. Student presentation
7. Laboratory visit
8. Group discussion

**Suggested Readings:**

6. Wills, R.B.H. and Golding, J. *Advances in Postharvest Fruit and Vegetable Technology*, CRC Press. 2017.
7. Thompson, A.K. (Ed.). *Fruit and Vegetables: Harvesting, Handling and Storage* (Vol. 1 & 2) Blackwell Publishing Ltd, Oxford, UK. 2014.
8. Chattopadhyay, S.K. *Handling, transportation and storage of fruit and vegetables*. Gene- Tech books, New Delhi. 2007.
9. Bhattacharjee, S.K. and Dee, L.C. *Postharvest technology of flowers and ornamental plants*. Pointer publishers, Jaipur. 2005.
10. Verma, L.R. and Joshi, V.K. *Postharvest Technology of Fruits and Vegetables: Handling, Processing, Fermentation and Waste Management*. Indus Publishing Company, New Delhi, India. 2000.









## Department of Horticulture

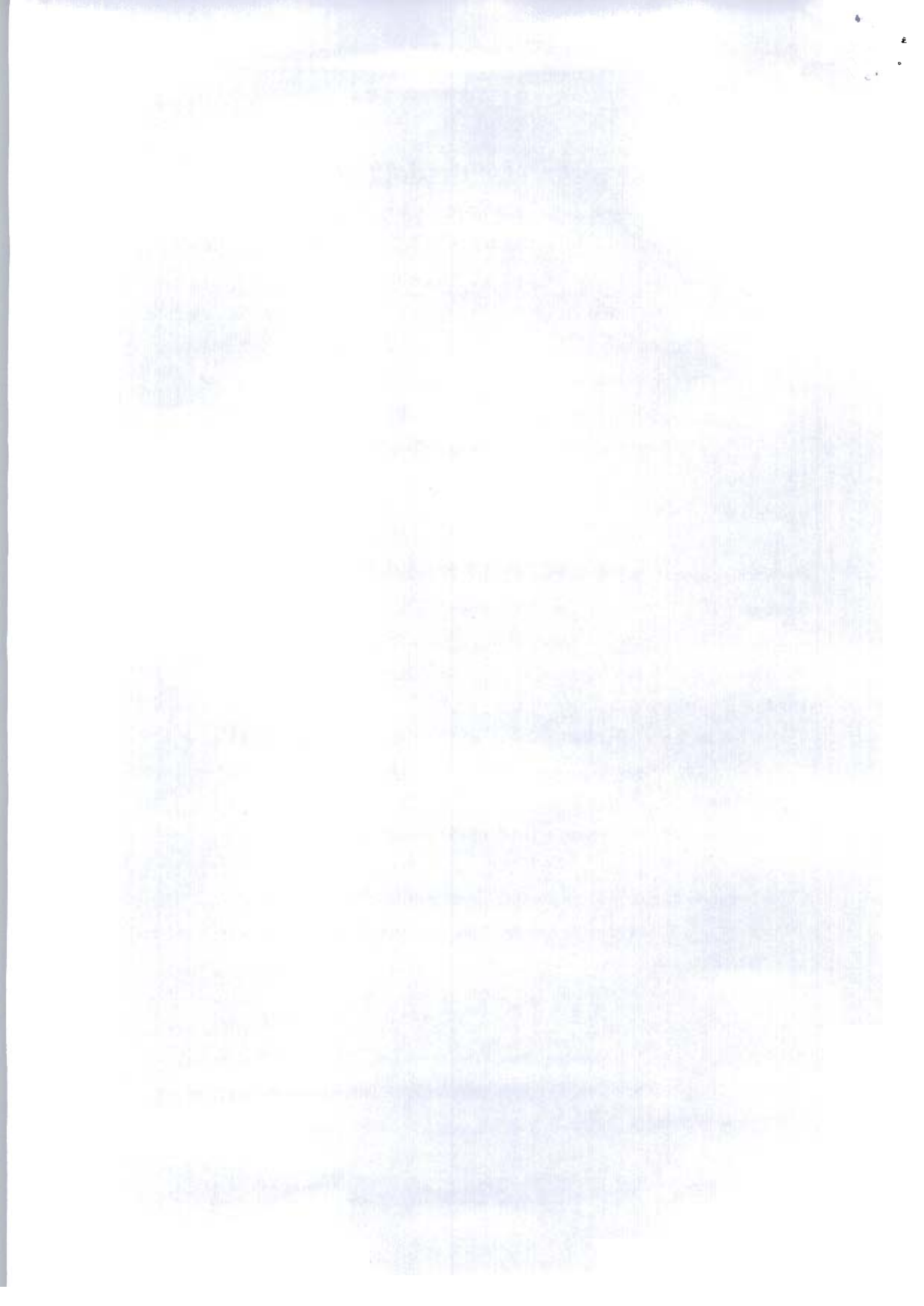
### Proceeding of the Board of Studies of Pre-Ph.D. Course in Horticulture

An online cum offline (Hybrid mode) Board of Studies meeting for Pre-Ph.D. course of Horticulture was held on June 9, 2023 at 12:00 PM in the Department of Horticulture, C.C.S. University, Meerut through Zoom meeting App. Following committee members were present to discuss/revise the Pre-Ph.D. course of Horticulture.

1. Dr. Shailendra S. Gaurav, *Professor and Dean* (Faculty of Agriculture), CCS Univ., Meerut.
2. Dr. Jitendra Kumar, *Professor and Head*, Dept. of Horticulture, CCSU, Meerut (Convener-I)
3. Dr. Shankar Kumar Bairagi, *Professor*, Dept. of Horticulture, A. S. College, Lakhaoti (Convener-II)
4. Dr. Sunil Malik, *Professor and Head*, Deptt. of Horticulture, SVPUA&T, Meerut
5. Dr. Ranjan Srivastava, *Professor & Ex-Head*, Dept. of Horticulture, GBPUA&T, Pantnagar, US Nagar, Utrakhland.
6. Dr. Vijai Kumar, *Professor*, Deptt. of Horticulture, CSSS (PG) College, Machhra, Meerut
7. Dr. Ram Chandra, *Associate Professor*, Dept. of Horticulture, A. S. College, Lakhaoti, Bulandshahr.
8. Dr. Pavitra Dev, *Assistant Professor*, Deptt. of Horticulture, CCS Univ. Campus, Meerut

All the members discussed about Pre-Ph.D. course of Horticulture for Ph.D. Horticulture Programme in C.C.S. University, Meerut. The members discussed the content of the course/syllabi and following decisions were made.

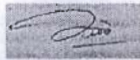
1. Pre-Ph.D. course of Research methodology of 4 credits and its syllabus will be uniform of all subjects of Ph.D. programme as discussed in the meeting held on 02.06.2023 in IQAC meeting hall. Therefore, the same syllabus of Research methodology will be adopted in subject Horticulture like syllabus of other subjects of Ph.D. programme in University.



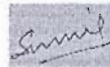
2. There will be two subject related courses of Horticulture of 4 credits each i.e. Advances in Horticultural Research, and Postharvest Management of Horticultural Crops
3. One dissertation will be of 4 credits.
4. Pattern of examination, passing marks, determination of CGPA/division, number of teaching hours, total marks of each paper etc. shall be as per rules.
5. The final draft of syllabus of subject related Pre-Ph.D. courses is also enclosed.



(Shankar Kumar Bairagi)



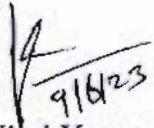
(Ram Chandra)



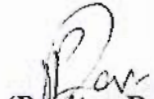
(Sunil Malik)



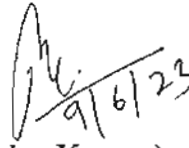
(Ranjan Srivastava)



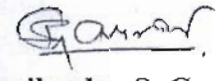
(Vijai Kumar)



(Pavitra Dev)



(Jitendra Kumar)



(Shailendra S. Gaurav)

*Submitted for kind approval*

Vice Chancellor/Academic Council



