



UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A ++' GRADE' UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section

Email: academicsectionju14@gmail.com

NOTIFICATION (25/August/Adp./38)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the syllabus and Courses of studies of the subject of **Horticulture Technology** for semester I and II for **Four Year Undergraduate Programme** as per **Nep-2020 (as given in annexure)** for the **Regular Candidates** for the examinations to be held in the years as per the details given below:-

Subject	Semester	For the examinations to be held in the year
Horticulture Technology	Semester-I	Dec. 2025, 2026 and 2027
	Semester-II	May 2026, 2027 and 2028

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/25/6856-75

Dated: 21/8/25

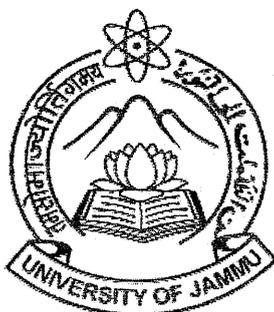
Copy for information and necessary action to:

1. Dean, Faculty of Life Science
2. HOD/Convener, Board of Studies in **Horticulture Technology**
3. All members of the Board of Studies
4. Sr. P.A. to the Controller of Examinations
5. Director, Centre for IT Enabled services and Management, University of Jammu for information and for uploading on University Website.
6. C.A. to the Controller of Examinations
7. Director, Computer Centre, University of Jammu.
8. Joint Registrar/Deputy Registrar/Asst. Registrar (Conf./Exam UG/Exam. Non Prof.)

Abuoca
20/8/25
Joint Registrar (Academic)

HS 20/8
92
M 20/8/22

DEAN, FACULTY OF LIFE SCIENCES
UNIVERSITY OF JAMMU



CURRICULUM FRAMEWORK FOR
FOUR-YEAR UNDER GRADUATE PROGRAM (FYUGP) IN
BSc. HORTICULTURE TECHNOLOGY
SEMESTER I & 2

AS PER

National Education Policy-2020

WITH EFFECT FROM THE ACADEMIC YEAR 2025-26

Approved by:

Board of Studies in Horticulture Technology

DEAN, FACULTY OF LIFE SCIENCES, UNIVERSITY OF JAMMU, JAMMU

Following courses of study are prescribed for
FYUGP (I & II Semesters) program in the subject of Horticulture Technology
as per **NEP-2020**

SEMESTER	TYPE OF THE COURSE	TITLE OF THE COURSE	COURSE NO.	CREDITS (T-Teaching P- Practical)
FIRST	MAJOR	Fundamentals of Horticulture	UMJHCT101	4 (3T + 1P)
	MINOR	Basics of Horticulture	UMIHCT102	4 (3T + 1P)
	MULTIDISCIPLINARY	Elementary Horticulture	UMDHCT103	3 (T)
	SKILL ENHANCEMENT	Commercial Horticulture	USEHCT104	3 (1T + 2P)
SECOND	MAJOR	Plant Propagation and Nursery Management	UMJHCT201	4 (3T + 1P)
	MINOR	Propagation Techniques and Nursery Practices	UMIHCT202	4 (3T + 1P)
	MULTIDISCIPLINARY	Elementary Horticulture	UMDHCT203	3 (T)
	SKILL ENHANCEMENT	Nursery and Gardening	USEHCT204	3 (1T + 2P)

COURSE SCHEME OF SYLLABUS
BACHELOR OF HORTICULTURE TECHNOLOGY (GENERAL/HONOURS/HONOURS WITH RESEARCH)
SEMESTER I
 (AS PER THE GUIDELINES OF NATIONAL EDUCATION POLICY-2020)
(The Examinations to be held in the year December 2025, 2026 & 2027)

S. No	Course type	Course No.	Course Title	Credits	Marks			
					Theory		Practical	
					Mid Semester	End Exam	Assessment	Exam
1	Major	UMJHCT101	Fundamentals of Horticulture	4 (3T+1P)	15	60	10	15
2	Minor	UMIHCT102	Basics of Horticulture	4 (3T+1P)	15	60	10	15
3	MDC	UMDHCT103	Elementary Horticulture	3 (T)	15	60	NA	NA
4	SEC	USEHCT104	Commercial Horticulture	3 (1T + 2P)	5	40	NA	5

[Handwritten Signature]

Prof. (Assistant) Sharma
 Dean
 Faculty of Horticulture
 University of Jammu
 Jammu (J.K.)

MAJOR COURSE)
Course title: Fundamentals of Horticulture
UG SEMESTER I
(As Per National Education Policy–2020)
The Examinations to be held in the year December 2025, 2026 & 2027

Course No. UMJHCT101

Max. Marks: 100 (Theory-75, Practical-25)

	Credits	Contact Hours	Units	Examination			
				Duration	(hours)	Weightage	(Marks)
Theory	03	45	I to IV	1½	03	15	60
Practical	01	30	V	1½	3½	10	15

Objectives: *The course aims to familiarize students with various branches of horticulture, plant classification and essential practices such as propagation, nursery management and cultural operations, thereby laying a strong base for advanced learning and practical applications in the field.*

Expected outcomes: *By the end of this course, students can plan and recommend sustainable horticultural crop production techniques.*

UNIT I: INTRODUCTION TO HORTICULTURE

- 1.1 Horticulture-Its definition, importance and scope
- 1.2 Branches of horticulture: Pomology, Olericulture, Floriculture Landscape gardening, Post harvest technology, plantation crops, spices and condiments
- 1.3 Role of fruits and vegetables in human diet
- 1.4 Importance of horticulture industry in the national economy with special reference to Jammu & Kashmir

UNIT II: CLIMATE REQUIREMENTS AND PHYSIOLOGY OF HORTICULTURAL CROPS

- 2.1 Classification of Fruits, vegetables and flowers based on their climatic requirement
- 2.2 Climate zones of horticulture crops -India and Jammu & Kashmir
- 2.3 Factors influencing the fruitfulness and unfruitfulness
- 2.4 Pollination, pollinizers and pollinators; fertilization and parthenocarpy

UNIT III: ORCHARD ESTABLISHMENT AND MANAGEMENT

- 3.1 Layout and planting of orchard plants
- 3.2 Principles and methods of training and pruning; Rejuvenation of old orchards, top working, frame working.
- 3.3 Plant propagation-methods and propagating structures
- 3.4 Use of plant bio-regulators in horticulture; Irrigation & fertilizers application-method and quantity

UNIT IV: VEGETABLES, ORNAMENTAL CROPS, MEDICINAL AND AROMATIC PLANTS

- 4.1 Vegetable gardens, Nutrition and kitchen garden and other types of gardens
- 4.2 Lawn making; Landscape uses of trees, shrubs and climbers
- 4.3 Medicinal and aromatic plants
- 4.4 Spices and condiments

UNIT V: PRACTICALS

- 5.1 Identification of garden tools, Nomenclature and Identification of horticultural crop
- 5.2 Preparation of seed bed/nursery bed, Layout and planting of orchard plants, Training and pruning of fruit trees
- 5.3 Practice of sexual and asexual methods of propagation, Transplanting and care of vegetable seedlings
- 5.4 Making of herbaceous and shrubby borders, Preparation of potting mixture, potting and repotting, Fertilizer application in different crops, Visits to commercial nurseries/orchard

NOTE FOR PAPER SETTERS:

Examination Theory/Practical	Syllabus to be covered in Examination	Time Allotted for Exam	Marks
Internal Theory Assessment (Mid semester)	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous Assessment (practical)	-	-	10 (Based on Daily Performance only)
Final Examination (Practical)	-	-	15

Explanation:

End Semester University Examination (Total Marks: 60; syllabus to be covered: 100%)

The question paper will have 2 sections. Section 'I' will be compulsory having four questions of 3 marks each and spread over the entire theory syllabus (one from each unit, i.e., Units I to IV). The questions will be of short answer type having answers not exceeding 50 to 70 words. Section 'II' will have eight long answer type questions, two from each unit I to IV. Each question will be of 12 marks. The candidates will be required to answer one question from each unit.

Mid Semester Assessment Test (Total Marks: 15; syllabus to be covered: up to 50%)

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Singh, J. 2011. Basic Horticulture. Kalyani Publication. New Delhi
2. Handbook of Horticulture 2nd Edition ICAR Vol 1 & 2. New Delhi
3. Aswath, C, Bose T. K, Dutta K, Reeta Bhatia and Saha T N Commercial Flowers Vol. 2
4. Chadha, K. L 2019. Handbook of Horticulture Vol 1 and Vol 2, ICAR
5. Dhaliwal, M. S 2014. Handbook of Vegetable Crops. Kalyani Publishers
6. Bose and Som 2003. Vegetable crops Vol I II and III. Naya Prokash
7. Hazara and Som 2015. Technology for Vegetable production and Improvements. Naya Prokash

MINOR COURSE
Course Title: BASICS OF HORTICULTURE
UG SEMESTER I

(As Per National Education Policy–2020)
The Examinations to be held in the year December 2025, 2026 & 2027

Course No. UMIHCT102

Max. Marks: 100 (Theory-75, Practical-25)

	Credits	Contact Hours	Units	Examination			
				Duration	(hours)	Weightage	(Marks)
Theory	03	45	I to IV	1½	03	15	60
Practical	01	30	V	1½	3½	10	15

Objectives: The course aims to familiarize students with various branches of horticulture, plant classification and essential practices such as propagation, nursery management and cultural operations, thereby laying a strong base for advanced learning and practical applications in the field.

Expected outcomes: By the end of this course, students can plan and recommend sustainable horticultural crop production techniques.

UNIT I: INTRODUCTION TO HORTICULTURE

- 1.1 Horticulture-Its definition, importance and scope
- 1.2 Branches of horticulture: Pomology, Olericulture, Floriculture Landscape gardening, Post harvest technology, plantation crops, spices and condiments
- 1.3 Role of fruits and vegetables in human diet
- 1.4 Importance of horticulture industry in the national economy with special reference to Jammu & Kashmir

UNIT II: CLIMATE REQUIREMENTS AND PHYSIOLOGY OF HORTICULTURAL CROPS

- 2.1 Classification of Fruits, vegetables and flowers based on their climatic requirement
- 2.2 Climate zones of horticulture crops -India and Jammu & Kashmir
- 2.3 Factors influencing the fruitfulness and unfruitfulness
- 2.4 Pollination, pollinizers and pollinators; fertilization and parthenocarpy

UNIT III: ORCHARD ESTABLISHMENT AND MANAGEMENT

- 3.1 Layout and planting of orchard plants
- 3.2 Principles and methods of training and pruning; Rejuvenation of old orchards, top working, frame working.
- 3.3 Plant propagation-methods and propagating structures
- 3.4 Use of plant bio-regulators in horticulture; Irrigation & fertilizers application-method and quantity

UNIT IV: VEGETABLES, ORNAMENTAL CROPS, MEDICINAL AND AROMATIC PLANTS

- 4.1 Vegetable gardens, Nutrition and kitchen garden and other types of gardens
- 4.2 Lawn making; Landscape uses of trees, shrubs and climbers
- 4.3 Medicinal and aromatic plants
- 4.4 Spices and condiments



UNIT V: PRACTICALS

5.1 Identification of garden tools Nomenclature and Identification of horticultural crops, Practice of sexual and asexual methods of propagation

5.2 Preparation of seed bed/nursery bed, Layout and planting of orchard plants, Training and pruning of fruit trees, Transplanting and care of vegetable seedlings

5.3 Making of herbaceous and shrubby borders, Preparation of potting mixture, potting and repotting, Fertilizer application in different crops,

5.4 Visits to commercial nurseries/orchard

NOTE FOR PAPER SETTERS:

Examination Theory/Practical	Syllabus to be covered in Examination	Time Allotted for Exam	Marks
Internal Theory Assessment (Mid semester)	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous Assessment (practical)	-	-	10 (Based on Daily Performance only)
Final Examination (Practical)	-	-	15

Explanation:

End Semester University Examination (Total Marks: 60; syllabus to be covered: 100%)

The question paper will have 2 sections. Section 'I' will be compulsory having four questions of 3 marks each and spread over the entire theory syllabus (one from each unit i.e., Units I to IV). The questions will be of short answer type having answers not exceeding 50 to 70 words. Section 'II' will have eight long answer type questions, two from each unit I to IV. Each question will be of 12 marks. The candidates will be required to answer one question from each unit.

Mid Semester Assessment Test (Total Marks: 15; syllabus to be covered: up to 50%)

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings

1. Bal, J. S. 2014. Fruit growing, 434 p.
2. Chattopadhyay, T. K. 2013. A Textbook on Pomology Vol I-IV, Kalyani Publishers, New Delhi.
3. Chadha, K. L 2019. Handbook of Horticulture Vol 1 and Vol 2, ICAR.
4. Dhaliwal, M. S 2014. Handbook of Vegetable Crops. Kalyani Publishers.
5. Bose and Som 2003. Vegetable crops Vol I II and III. Naya Prokash.
6. Hazara and Som 2015. Technology for Vegetable production and Improvements. Naya Prokash.



MULTIDISCIPLINARY COURSE
Course Title: ELEMENTARY HORTICULTURE
UG SEMESTER I
(As Per National Education Policy–2020)
The Examinations to be held in the year December 2025, 2026 & 2027

Course No. UMDHCT103

Max. Marks: Theory-75

	Credits	Contact Hours	Units	Examination			
				Duration (Hours)		Weightage	
				Mid Sem	End Sem	Mid Sem	End Sem
Theory	03	45	I to IV	1½	03	15	60

Objectives: *The course is designed to introduce students to the fundamental concepts, practices and importance of horticulture and to develop basic skill in plant cultivation and management.*

Expected outcomes: *By the end of the course, students will be able to identify and classify horticultural crops. Furthermore, they will recognize the significant role of horticulture in enhancing livelihoods, promoting environmental sustainability and ensuring nutritional security. Students will gain insights into the cultivation of flowers and value addition of horticulture crops.*

UNIT I: FUNDAMENTALS OF HORTICULTURE

- 1.1 Introduction and scope of horticulture in Jammu Division
- 1.2 An overview of Horticulture crops of Jammu Division (vegetable crops, fruit crops, ornamentals, medicinal & aromatic plants)
- 1.3 Area, production and productivity of major horticulture crops in Jammu Division
- 1.4 Concept of orchards, home gardens, floating gardens, and kitchen gardens for growing fruit and vegetable crops

UNIT II: COMMERCIAL FRUIT PRODUCTION

- 2.1 Importance, scope and commercial importance of fruits
- 2.2 Area, production and export potential of fruit crops; Agri. Export Zones (AEZ) and industrial support
- 2.3 Soil and climate requirements of important fruit crops such as mango, citrus, guava, litchi, grapes, walnut, apple and strawberry.
- 2.4 Major species and their varieties

UNIT III: PLANT MANAGEMENT

- 3.1 Brief account of propagation techniques with special reference to vegetable and fruit crops
- 3.2 Soil fertility and factors affecting soil fertility, fertilizer types and management for crop growth and yield; essential micro and macro elements that affect crop growth and yield
- 3.3 Irrigation and its methods
- 3.4 Canopy management

UNIT IV: CULTIVATION AND VALUE ADDITION

4.1 Scope of cultivation of medicinal and ornamental plants

4.2 Commercial floriculture in Jammu division, concept and scope of cut flower technology, post-harvest management of cut flowers (examples- rose, marigold, chrysanthemum, gladiolus, and other locally important ornamentals)

4.3 Value addition in important fruit and vegetable crops of Jammu division (preparation of Juices, Jams, jellies, pickles, sauces etc.)

4.4 Economic potential and employment opportunities in horticulture sector of Jammu Division

NOTE FOR PAPER SETTERS

Examination Theory/Practical	Syllabus to be covered in Examination	Time Allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60

End Semester University Examination (Total Marks: 60; syllabus to be covered: 100%)

The question paper will have 2 sections. Section 'I' will be compulsory having four questions of 3 marks each and spread over the entire theory syllabus (one from each unit i.e., Units I to IV). The questions will be short answer type having answers not exceeding 50 to 70 words. Section 'II' will have eight long answer type questions, two from each unit. Each question will be of 12 marks. The candidates will be required to answer one question from each unit.

Mid Semester assessment Test (Total Marks: 15; syllabus to be covered: up to 50%)

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Adams, C.R. and M. P. Early. 2004. Principles of horticulture. Butterworth – Heinemann, Oxford University Press.
2. Bansil. P.C. 2008. Horticulture in India. CBS Publishers and Distributors, New Delhi.
3. Kumar, N. 1997. Introduction to Horticulture, Rajalakshmi Publication, Nagercoil.
4. Chadha, K.L. 2001, Handbook of Horticulture, ICAR, New Delhi.
5. Christopher, E.P. 2001. Introductory Horticulture, Biotech Books, New Delhi.
6. Edmond, J.B. T.L.Senn, F.S. Andrews and P.G.Halfacre, 1975. Fundamentals of Horticulture, Tata MC. Graw Hill Publishing Co. New Delhi.

SKILL ENHANCEMENT COURSE

Course Title: **COMMERCIAL HORTICULTURE**
UG SEMESTER I

(As Per National Education Policy–2020)

The Examinations to be held in the year December 2025, 2026 & 2027

Course No. **USEHCT104**

Max. Marks: **75 (Theory-25, Practical-50)**

	Credits	Contact Hours	Units	Examination		Weightage (Marks)
				Duration (hours)		
				Mid Term Examination	Final Examination	
Theory	01	15	I	1½	-	25
Practical	02	60	II to III	-	3	50

Objectives: The course is designed to equip students with the knowledge and skills necessary for the large-scale production, management and marketing of horticultural crops. This course will promote entrepreneurial thinking and prepare students for self-employment and agribusiness in the horticulture sector.

Expected outcomes: By the end of this course, they will be able to understand the principles and practices involved in commercial production of fruits, vegetables and flowers.

UNIT I: Scope of Horticulture

- 1.1 Importance, scope and commercial importance of fruits grown in Jammu division
- 1.2 Distribution of sub-tropical zones in the world and India; Industrial and export potential, Agri. Export Zones (AEZ).
- 1.3 Origin, distribution, genetic resources of the fruit crops of Jammu division.
- 1.4 Eco-physiological requirements important fruit crops of the Jammu division

UNIT II: PRACTICAL: Orchard Planning and Management

- 2.1 Major species, commercial varieties and rootstocks
- 2.3 Propagation methods, planting and HDP
- 2.3 Training and pruning, Canopy management, Leaf sampling and nutrient analysis, Preparation and application of growth regulators
- 2.4 Orchard floor, Nutrient and water management, Visit to commercial orchards and Diagnosis of maladies

UNIT III: PRACTICAL: Pre and Post harvest management and plant protection

- 3.1 Selection of site and planting system
- 3.2 Maturity indices, harvesting, grading, packing, storage and ripening techniques.
- 3.3 Production economics of important fruit crops of the region
- 3.4 Manure and fertilizer application including bio-fertilizers in fruit crop

NOTE FOR PAPER SETTERS

Mid Term Examination

The question paper will be of **25 marks**. There shall be **2 Sections** in the question paper with pattern as follows: **Section-A** shall comprise of **4** short answer type questions covering the entire first Unit. The students have to attempt all the **4** questions from this section. Each question carries 2½ marks.

Section-B shall comprise of a total of **6** questions from Unit I. Each question shall be of **5 marks**. The students have to attempt any **3** questions.

EVALUATION OF SKILLS: *Final Examination*

The Evaluation of Skills will be internal. The Examination of Skills shall be of **50** marks. The evaluation of skills will be done internally through the Board of three Members (including the trainer of the Course).

Suggested readings

1. Sharma, R. R and Krishna, H. 2017. Textbook of Plant Propagation and Nursery Management. C B S Publishers. New Delhi.
2. Sharma, R. R and Srivastava, M. 2004. Plant Propagation and Nursery Management. IBDC Publishers. New Delhi.
3. Bose and Som 2003. Vegetable crops Vol I II and III. Naya Prakash.
4. Hazara and Som 2015. Technology for Vegetable production and Improvements. Naya Prokash.



COURSE SCHEME OF SYLLABUS

BACHELOR OF HORTICULTURE TECHNOLOGY (GENERAL/HONOURS/HONOURS WITH RESEARCH)
SEMESTER II

(As Per National Education Policy–2020)
The Examinations to be held in the year May 2026, 2027 & 2028

S. No	Course type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical		
					Mid Semester	End Exam	Assessment	Exam	
1	Major	UMJHCT 201	Plant Propagation and Nursery Management	4 (3T+1P)	15	60	10	15	100
2	Minor	UMIHCT 202	Propagation Techniques and Nursery Practices	4 (3T+1P)	15	60	10	15	100
3	MDC	UMDHCT 203	Elementary Horticulture	3	15	60	NA	NA	75
4	SEC	USEHCT 204	Nursery and Gardening	3 (1T+2P)	5	40	NA	5	50



MAJOR COURSE

Course Title: PLANT PROPAGATION AND NURSERY MANAGEMENT SEMESTER II

(As Per National Education Policy–2020)

The Examinations to be held in the year May 2026, 2027 & 2028

Course No. UMJHCT201

Max. Marks: 100 (Theory-75, Practical-25)

	Credits	Contact Hours	Units	Examination			
				Duration	(hours)	Weightage	(Marks)
Theory	03	45	I to IV	1½	03	15	60
Practical	01	30	V	1½	3½	10	15

Objectives: The course is designed to know different methods of propagation techniques and horticultural significance of specialized vegetative structures. It will empower students to master various propagation methods essential for successful plant multiplication.

Expected outcomes: By the end of this course, students will gain hands on knowledge of various plant propagation methods and will develop skills to identify select and apply appropriate techniques for different horticultural crops.

UNIT I: PLANT PROPAGATION

- 1.1 Status and importance of plant propagation and nursery production in fruits and plantation crops
- 1.2 Sexual and asexual methods of propagation, their advantages and disadvantages. Methods of asexual propagation: Cutting, layering, grafting and budding
- 1.3 Apomixes and its types. Propagation by specialized vegetative structures: runner, suckers, rhizome, crown, corm, stolon, stem tuber, offset and plant propagation by division
- 1.4 Role of tissue culture techniques viz., Micropropagation, Micrografting and Meristem culture.

UNIT II: MOTHER ORCHARD, ROOTSTOCKS AND PROPAGATION STRUCTURES

- 2.1 Selection of mother trees, establishment of mother orchards and criteria for collection of scion wood / bud wood for propagation;
- 2.2 Rootstocks for different fruit species and their propagation
- 2.3 Propagation structures in nursery production: Mist chamber, Humidifiers, Greenhouses, Glasshouses, Cold frames, Hot beds and Polyhouses.
- 2.4 Use of growth regulators in nursery production

ln.

UNIT III. NURSERY RAISING

- 3.1 Introduction and pre requisites of an ideal fruit nursery; Selection of site and layout of model nursery
- 3.2 Seed dormancy, types of dormancy and methods to overcome seed dormancy: scarification, stratification, chemical treatment and use of hormones
- 3.3 Orthodox and recalcitrant seeds; seed viability, seed sowing, seed storage and cryopreservation.
- 3.4 Raising seedlings in nursery: nursery bed preparation, sowing methods (broadcasting, line sowing and dibbling), watering and protection measures

UNIT IV: NURSERY PRACTICES AND MANAGEMENT

- 4.1 Potting and Repotting: Growing medium and containers used for nursery production
- 4.2 Irrigation, fertilization, weed and pest and diseases management
- 4.3 Packing and labelling of nursery plants; Maintenance of nursery records
- 4.4 Nursery Registration Act and nursery standards

UNIT V: PRACTICALS

- 5.1 Use and maintenance of common propagation and nursery tools and equipment, Mist chamber, humidifiers, greenhouses, glasshouses, cold frames, hot beds and poly-houses
- 5.2 Use of growth regulators in plant propagation, Hormonal powders, paste, solutions, methods of application, Components of a nursery, maintenance of mother trees and seed gardens, collection of scion-wood, and bud wood certification, growth media and containers used for nursery production
- 5.3 Role of tissue culture techniques viz. micropropagation, micrografting and meristem culture
- 5.4 Practice in various plant propagation methods viz. Grafting, Budding, layering and cutting techniques etc.; Aftercare of asexually propagated trees
- 5.6 Management of insect-pests and diseases in nursery, Economics of commercial nursery production

NOTE FOR PAPER SETTERS:

Examination Theory/Practical	Syllabus to be covered in Examination	Time Allotted for Exam	Marks
Internal Theory Assessment (Mid semester)	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous Assessment (practical)	-	-	10 (Based on Daily Performance only)
Final Examination (Practical)	-	-	15

Explanation:**End Semester University Examination (Total Marks: 60; syllabus to be covered: 100%)**

The question paper will have 2 sections. Section 'I' will be compulsory having four questions of 3 marks each and spread over the entire theory syllabus (one from each unit i.e., Units I to IV). The questions will be of short answer type having answers not exceeding 50 to 70 words. Section 'II' will have eight long answer type questions, two from each unit I to IV. Each question will be of 12 marks. The candidates will be required to answer one question from each unit.

Mid Semester Assessment Test (Total Marks: 15; syllabus to be covered: up to 50%)

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings

1. Bose, T. K., Mitra, S. K., Sadhu, M. K. and Das, P. 2001. Propagation of Tropical and Subtropical Crops. Naya Prokash Publishers, Calcutta.
2. Subtropical Crops. Naya Prokash Publishers, Calcutta.
3. Chadha, K.L. 2001. Handbook of Horticulture. Indian Council of Agricultural Research. New Delhi.
4. Chattopadhyay, T.K. 1999. A Text Book of Pomology. Vol. I-IV. Kalyani Publishers, Ludhiana.
5. Gill, S.S., Bal, J.S. and Sandhu, A.S. 1985. Raising Fruit Nursery. Kalyani Publishers, Ludhiana.
6. Hartmann, H.T., Kester, D.E. and Davies, F.T. 1993. Plant Propagation. Prentice Hall of India Pvt. Limited, New Delhi.
7. Kunte, Y.N., Kawthalkar, M.P. and Yawalkar, K.S. 2005. Principles of Horticulture and Fruit Growing. Agri-Horticultural Publishing House, Nagpur.
8. Sharma, R. R. 2002. Propagation of Horticultural Crops (Principles and practices). Kalyani Publishers, Ludhiana.
9. <http://www.iihr.ernet.in>
10. <http://www.angrau.ac.in/>



MINOR COURSE

Course Title: **PROPAGATION TECHNIQUES AND NURSERY PRACTICES**
SEMESTER II

(As Per National Education Policy–2020)

The Examinations to be held in the year May 2026, 2027 & 2028

Course No. UMIHCT202

Max. Marks: 100 (Theory-75, Practical-25)

	Credits	Contact Hours	Units	Examination			
				Duration	(hours)	Weightage	(Marks)
Theory	03	45	I to IV	1½	03	15	60
Practical	01	30	V	1½	3½	10	15

Objectives: The course is designed to know different methods of propagation techniques and horticultural significance of specialized vegetative structures. It will empower students to master various propagation methods essential for successful plant multiplication.

Expected outcomes: By the end of this course, students will gain hands on knowledge of various plant propagation methods and will develop skills to identify select and apply appropriate techniques for different horticultural crops.

UNIT I: PLANT PROPAGATION

- 1.1 Status and importance of plant propagation and nursery production in fruits and plantation crops
- 1.2 Sexual and asexual methods of propagation, their advantages and disadvantages. Methods of asexual propagation: Cutting, layering, grafting and budding
- 1.3 Propagation by specialized vegetative structures: runner, suckers, rhizome, crown, corm, stolon, stem tuber, offset and plant propagation by division
- 1.4 Role of tissue culture techniques viz., Micropropagation, Micrografting and Meristem culture.

UNIT II: MOTHER ORCHARD, ROOTSTOCKS AND PROPAGATION STRUCTURES

- 2.1 Selection of mother trees, establishment of mother orchards and criteria for collection of scion wood / bud wood for propagation;
- 2.2 Rootstocks for different fruit species and their propagation
- 2.3 Propagation structures in nursery production: Mist chamber, Humidifiers, Greenhouses, Glasshouses, Cold frames, Hot beds and Polyhouses.
- 2.4 Use of growth regulators in nursery production

UNIT III. NURSERY RAISING

- 3.1 Introduction and pre requisites of an ideal fruit nursery; Selection of site and layout of model nursery
- 3.2 Seed dormancy, types of dormancy and methods to overcome seed dormancy: scarification, stratification, chemical treatment and use of hormones
- 3.3 Orthodox and recalcitrant seeds; seed viability, seed sowing, seed storage and cryopreservation.
- 3.4 Raising seedlings in nursery: nursery bed preparation, sowing methods (broadcasting, line sowing and dibbling), watering and protection measures

UNIT IV: NURSERY PRACTICES AND MANAGEMENT

- 4.1 Potting and Repotting: Growing medium and containers used for nursery production
- 4.2 Irrigation, fertilization, weed and pest and diseases management
- 4.3 Packing and labelling of nursery plants; Maintenance of nursery records
- 4.4 Nursery Registration Act and nursery standards

UNIT V: PRACTICALS

- 5.1 Use and maintenance of common propagation and nursery tools and equipment: Mist chamber, humidifiers, greenhouses, glasshouses, cold frames, hot beds and poly-houses
- 5.2 Use of growth regulators in plant propagation, Hormonal powders, paste, solutions, methods of application
- 5.3 Components of a nursery, maintenance of mother trees and seed gardens, collection of scion-wood
- 5.4 Growth medium and containers used for nursery production, Role of tissue culture techniques viz. micropropagation, micrografting and meristem culture
- 5.5 Practice in various plant propagation methods viz. Grafting, Budding, layering and cutting techniques etc.; Aftercare of asexually propagated trees
- 5.6 Management of insect-pests and diseases in nursery
- 5.7 Economics of commercial nursery production

NOTE FOR PAPER SETTERS

Examination Theory/Practical	Syllabus to be covered in Examination	Time Allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous Assessment	-	-	10 (Based on Daily Performance only)
Final Examination	-	-	15



External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A: Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Bose, T. K., Mitra, S. K., Sadhu, M. K. and Das, P. 2001. Propagation of Tropical and Subtropical Crops. NayaProkash Publishers, Calcutta.
2. Subtropical Crops. NayaProkash Publishers, Calcutta.
3. Chadha, K.L. 2001. Handbook of Horticulture. Indian Council of Agricultural Research. New Delhi.
4. Chattopadhyay, T.K. 1999. A Text Book of Pomology. Vol. I-IV. Kalyani Publishers, Ludhiana.
5. Gill, S.S., Bal, J.S. and Sandhu, A.S. 1985. Raising Fruit Nursery. Kalyani Publishers, Ludhiana.
6. Hartmann, H.T., Kester, D.E. and Davies, F.T. 1993. Plant Propagation. Prentice Hall of India Pvt. Limited, New Delhi.
7. Kunte, Y.N., Kawthalkar, M.P. and Yawalkar, K.S. 2005. Principles of Horticulture and Fruit Growing. Agri-Horticultural Publishing House, Nagpur.
8. Sharma, R. R. 2002. Propagation of Horticultural Crops (Principles and practices). Kalyani Publishers, Ludhiana.
9. <http://www.iihr.ernet.in>
10. <http://www.angrau.ac.in/>

MULTIDISCIPLINARY COURSE
Course Title: ELEMENTARY HORTICULTURE
UG SEMESTER II
(As Per National Education Policy–2020)
The Examinations to be held in the year May 2026, 2027 & 2028

Course No. UMDHCT203

Max. Marks: Theory-75

	Credits	Contact Hours	Units	Examination			
				Duration (Hours)		Weightage	
				Mid Sem	End Sem	Mid Sem	End Sem
Theory	03	45	I to IV	1½	03	15	60

Objectives: *The course is designed to introduce students to the fundamental concepts, practices and importance of horticulture and to develop basic skill in plant cultivation and management.*

Expected outcomes: *By the end of the course, they will be able to identify and classify horticultural crops. Furthermore, they will recognize the significant role of horticulture in enhancing livelihoods, promoting environmental sustainability and ensuring nutritional security. Students will gain insights into the cultivation of flowers and value addition of horticulture crops.*

UNIT I: FUNDAMENTALS OF HORTICULTURE

- 1.1 Introduction and scope of horticulture in Jammu Division
- 1.2 An overview of Horticulture crops of Jammu Division (vegetable crops, fruit crops, ornamentals, medicinal & aromatic plants)
- 1.3 Area, production and productivity of major horticulture crops in Jammu Division
- 1.4 Concept of orchards, home gardens, floating gardens, and kitchen gardens for growing fruit and vegetable crops

UNIT II: COMMERCIAL FRUIT PRODUCTION

- 2.1 Importance, scope and commercial importance of fruits
- 2.2 Area, production and export potential of fruit crops; Agri. Export Zones (AEZ) and industrial support
- 2.3 Soil and climate requirements of important fruit crops such as mango, citrus, guava, litchi, grapes, walnut, apple and strawberry.
- 2.4 Major species and their varieties

UNIT III: PLANT MANAGEMENT

- 3.1 Brief account of propagation techniques with special reference to vegetable and fruit crops
- 3.2 Soil fertility and factors affecting soil fertility, fertilizer types and management for crop growth and yield; essential micro and macro elements that affect crop growth and yield
- 3.3 Irrigation and its methods
- 3.4 Canopy management



UNIT IV: CULTIVATION AND VALUE ADDITION

4.1 Scope of cultivation of medicinal and ornamental plants

4.2 Commercial floriculture in Jammu division, concept and scope of cut flower technology, post-harvest management of cut flowers (examples- rose, marigold, chrysanthemum, gladiolus, and other locally important ornamentals)

4.3 Value addition in important fruit and vegetable crops of Jammu division (preparation of Juices, Jams, jelleys, pickles, sauces etc.)

4.4 Economic potential and employment opportunities in horticulture sector of Jammu Division

NOTE FOR PAPER SETTERS

Examination Theory/Practical	Syllabus to be covered in Examination	Time Allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A: Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Adams, C.R. and M. P. Early. 2004. Principles of horticulture. Butterworth – Heinemann, Oxford University Press.
2. Bansil. P.C. 2008. Horticulture in India. CBS Publishers and Distributors, New Delhi.
3. Kumar, N.1997. Introduction to Horticulture, Rajalakshmi Publication, Nagercoil.
4. Chadha, K.L. 2001, Handbook of Horticulture, ICAR, New Delhi.
5. Christopher, E.P. 2001. Introductory Horticulture, Biotech Books, New Delhi.
6. Edmond, J.B. T.L.Senn, F.S. Andrews and P.G.Halfacre, 1975. Fundamentals of Horticulture, Tata MC. Graw Hill Publishing Co.New Delhi.

SKILL ENHANCEMENT COURSE

Course Title: NURSERY AND GARDENING

UG SEMESTER II

(As Per National Education Policy–2020)

The Examinations to be held in the year May 2026, 2027 & 2028

Course No. USEHCT104

Max. Marks: 75 (Theory-25, Practical-50)

	Credits	Contact Hours	Units	Examination		Weightage (Marks)
				Duration (hours)		
				Mid Term Examination	Final Examination	
Theory	01	15	I	1½	-	25
Practical	02	60	II to III	-	3	50

Objectives: The course aims to make students understand the theoretical and practical details of nursery and gardening.

Expected outcomes: The students will be able to distinguish and choose the plant species amenable for nursery and gardening. They can develop their own nursery for livelihood and marketing purpose.

UNIT I: INTRODUCTION TO NURSERY AND GARDENING

- 1.1 Definition and types of nurseries, physical resources for nurseries
- 1.2 Pre requisites of an ideal fruit nursery; Selection of site and layout of model nursery
- 1.3 Definition and components of garden, types of gardening (landscape and home gardening)
- 1.4 Scope and objective of gardening

UNIT II: PRACTICAL: PLANT PROPAGATION METHODS

- 2.1 Seed dormancy –causes and methods of breaking it, factors affecting seed germination.
- 2.2 Propagation by seed, various techniques of Asexual propagation, Micro-propagation and its importance, concept of soilless cultivation with reference to hydroponics and aeroponics.
- 2.3 Seed collection; extraction and storage: - seed maturity, seed harvesting, seed storage conditions, role of moisture and temperature, types of seed storage Types of seeds (Orthodox and recalcitrant)
- 2.4 Seed germination, pre-sowing seed treatments for improving germination; Sowing techniques (Broadcasting, line sowing and dibbling).

UNIT III: PRACTICAL; TOOLS, MEDIA AND EQUIPMENT FOR PROPAGATION

- 3.1 Propagation media (soil, sand, cocopeat, vermiculite and perlite) and their importance; Practice in various plant propagation methods viz. Grafting, Budding, layering and cutting techniques etc.; Aftercare of asexually propagated trees



3.2 Use of growth regulators in plant propagation, Hormonal powders, paste, solutions, methods of application; Application of manures and fertilizers; Preparation and use of organic and biofertilizers in nursery.

3.3 Tools and implements used in nursery and gardening: Mist chamber, Green house, polyhouse cold frame, hot bed, net house, etc., Use of polyhouse and shade net in nursery raising.

3.4 Preparation of seed and nursery beds; Seed sowing and raising of seedlings and transplanting, Potting, repotting, depotting and mulching, Maintenance of nursery records

NOTE FOR PAPER SETTERS

Mid Term Examination

The question paper will be of **25 marks**. There shall be **2 Sections** in the question paper with pattern as follows:

Section-A shall comprise of **4** short answer type questions covering the entire first Unit. The students have to attempt all the **4** questions from this section. Each question carries **2½** marks.

Section-B shall comprise of a total of **6** questions from Unit I. Each question shall be of **5 marks**. The students have to attempt any **3** questions.

EVALUATION OF SKILLS: Final Examination

The Evaluation of Skills will be internal. The Examination of Skills shall be of **50** marks. The evaluation of skills will be done internally through the Board of three Members (including the trainer of the Course).

Suggested readings:

1. Davies F T Geneve R L and Wilson S B 2018.
2. Hartmann and Kester's Plant Propagation Principles and Practices 9 th Edition Pearson. USA.
3. Sharma R R and Krishna H 2017. Textbook of Plant Propagation and Nursery Management.
4. C B S Publishers. New Delhi.
5. Sharma R R and Srivastava M 2004. Plant Propagation and Nursery Management. IBDC Publishers. New Delhi.
6. Handbook of Horticulture 2nd Edition ICAR Vol 1 & 2. New Delhi.
7. Peter K V 2002. Plantation crops. National Book Trust India, New Delhi.


Prof. Yash Pal Sharma
Dean
Faculty of Life Sciences
University of Jammu,
Jammu (J&K)