

National Education Policy-2020
Common Minimum Syllabus for all U.P. State Universities/ Colleges
SUBJECT: Horticulture

Name	Designation	Affiliation
Steering Committee		
Mrs. Monika S. Garg, (I.A.S.), Chairperson Steering Committee	Additional Chief Secretary	Department of Higher Education U.P., Lucknow
Prof. Poonam Tandan	Professor, Department of Physics	Lucknow University, U.P.
Prof. Hare Krishna	Professor, Department of Statistics	CCS University Meerut, U.P.
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Supervisory Committee – Science Streams		
Dr. Vijay Kumar Singh	Associate Professor, Department of Zoology	Agra College Agra
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Dr. Sanjay Jain	Associate Professor, Department of Statistics	St. John's College, Agra
Syllabus Developed By (Subject Committee)		
Dr. N. K. Singh	Associate Professor, Department of C. D. & Extension	B. V. R. I. Bichpuri, Agra
Dr. Kanhaiya Singh	Principal Scientist, Division of Fruits and Horticultural Technology	I. A. R. I. New Delhi
Dr. Awani Kumar Singh	Principal Scientist Horticulture-Vegetable Science, CPCT	I. A. R. I. New Delhi

Horticulture

- Subject prerequisites: 10+2 passed any subject.
- Programme outcomes (POs) - (after 3 years UG) explained commonly for faculty.
- **Programme specific outcomes (PSOs)- (after 3 years UG)**
 - 1) Transfer knowledge of horticulture including fruits, vegetables and flowers production and their post harvest management through teaching, research, extension and training.
 - 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 training and extension, especially for the development of socially and economically depressed segment of society.
 - 5) Establishment of models nurseries in rural areas for the availability of quality planting materials of fruits, vegetables and flowers.
 - 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.
- **List of all papers in all six semesters.**

Semester-wise Title of the Papers in B. A. (Horticulture)

Year	Semester	Course Code	Paper Title	Theory/Practical	Credits
I	I	A470101T	Fundamentals of Horticulture	Theory	6
	II	A470201T	Plant Propagation and Nursery Management	Theory	4
	II	A470202P	Nursery Management	Practical	2
II	III	A470301T	Preservation of Fruits and Vegetables	Theory	6
	IV	A470401T	Fruit Production	Theory	4
	IV	A470402P	Practical Fruit Production	Practical	2
III	V	A470501T	Vegetable Production	Theory	5
	V	A470502T	Vegetable Seed Production	Theory	5
	V	A470503R	Commercial Horticultural Nursery	Project	3
	VI	A470601T	Ornamental Horticulture and Landscape Gardening	Theory	5
	VI	A470602T	Commercial Floriculture	Theory	5
	VI	A470603R	Processing of Fruits and Vegetables	Project	3

Certificate in Horticulture
First Year, Sem. I,
Course I (Theory)

Programme/Class: Certificate	Year: First	Semester: First
Subject: Horticulture		
Course Code: A470101T	Course Title: Fundamentals of Horticulture	
Course outcomes:		
<ol style="list-style-type: none"> 1) The student will be able to understand different branches of horticulture. 2) The student will be able to learn about water, nutrient, and insect pest and disease management in horticultural crops. 3) Can demonstrate advanced technologies like training, pruning, etc in horticulture. 		
Credits: 6		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 6		
Unit	Topics	No. of Lectures
I	Scope and importance, classification of horticultural crops, area and production, fruit and vegetable zones of India and Uttar Pradesh.	12
II	Principles, planning and layout, planting systems and planting densities	11
III	Principles, objectives, types and methods of pruning and training of fruit crops, types and use of growth regulators in horticulture	11
IV	Water management– irrigation methods, merits and demerits, weed management	11
V	Integrated nutrient management in horticultural crops-manures and fertilizers, different methods of application	11
VI	Cropping systems, intercropping, multi-tier cropping, mulching– objectives, types merits and demerits	11
VII	Classification of bearing habits of fruit trees, factors influencing the fruitfulness and unfruitfulness,	11
VIII	Rejuvenation of old orchards, top working.	12
Suggested Readings:		
<ol style="list-style-type: none"> 1. Jitendra Singh, 2002. Basic Horticulture. Kalyani Publishers, Hyderabad. 2. T. K. Chattopadhyay, 1997. Text book on pomology. Volume I Kalyani Publishers, New 		

Delhi.

3. J. S. Bal, 1997. Fruit Growing, Kalyani Publishers, New Delhi.
4. जीतेन्द्र सिंह, २०१८. आधारीय बागवानी, कल्याणी प्रकाशक लुधियाना ।
5. आर. के. पाठक एवं सी. एम्. ओझा, २०११. फल विज्ञानं, भारतीय कृषि अनुसन्धान परिषद् नई दिल्ली ।
6. विशाल नाथ, दिनेश कुमार पाण्डेय, दीना नाथ सिंह, अजय मिश्र एवं मुहम्मद मुस्तफा, २०१२. उद्यान विज्ञानं के मौलिक सिद्धान्त, सतीश सीरियल पब्लिशिंग हाउस दिल्ली ।
7. राम रोशन शर्मा, २०१७. आधुनिक फलोत्पादन, कल्याणी प्रकाशक लुधियाना ।
8. विजेन्द्र सिंह एवं अशोक कुमार चौहान, २०१८. उद्यान विज्ञानं, कल्याणी प्रकाशक लुधियाना ।

This course can be opted as an elective by the students of following subjects: Open for all

Suggested Continuous Evaluation Methods:

Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.

Part B (5 marks): Class Interaction/Teacher Assessment

Course prerequisites: Nil.

Suggested equivalent online courses:

- Courses running in all the Agricultural Colleges/Institutes/Universities.

Certificate in Horticulture
First Year, Sem. II
Course I (Theory)

Programme/Class: Certificate	Year: First	Semester: Second
Subject: Horticulture		
Course Code: A470201T	Course Title: Plant Propagation and Nursery Management	
Course outcomes:		
<ol style="list-style-type: none"> 1) The student will be able to understand basis of plant propagation and nursery management techniques 2) Knowledge of nursery establishment and nursery rules and regulation. 3) Can demonstrate advanced propagation methods of horticultural crops. 		
Credits: 4		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 4		
Unit	Topics	No. of Lectures
I	Propagation: Need and potentialities for plant multiplication, sexual and asexual methods of propagation, advantages and disadvantages.	7
II	Seed dormancy, types of dormancy (scarification & stratification) internal and external factors, apomixes – mono-embryony and polyembryony.	8
III	Techniques of propagation through specialized organs, corms, runners, suckers and stolons.	8
IV	Propagation Structures: Mist chamber, humidifiers, and greenhouses.	7
V	Use of growth regulators in propagation, types and stages of seed germination with examples.	7
VI	Vegetative propagation, cutting, layering, grafting, budding, factor affecting healing of graftage and budding.	8
VII	Factors influencing rooting of cuttings and layering, selection and maintenance of mother trees.	7
VIII	Nursery registration act. Insect/pest/disease control in nursery.	8

Suggested Readings:

1. Hudson T. Hartmann, Dale E. Kester, Fred T. Davies, Jr. and Robert L. Geneve. 2017. Plant Propagation- Principles and Practices (7th Edition). PHI Learning Private Limited, New Delhi-110001.
2. R.R. Sharma, 2002. Propagation of Horticultural Crops–Principles and Practices. Kalyani Publishers, New Delhi.
3. J. S. Bal, 1997. Fruit Growing, Kalyani Publishers, New Delhi.
4. आर. के. पाठक, २०११. फल वृक्ष प्रवर्धन, भारतीय कृषि अनुसन्धान परिषद्, नई दिल्ली ।
5. जीतेन्द्र सिंह, २०१८. आधारीय बागवानी, कल्याणी प्रकाशक लुधियाना ।
6. आर. के. पाठक एवं सी. एम्. ओझा, २०११. फल विज्ञानं, भारतीय कृषि अनुसन्धान परिषद्, नई दिल्ली ।
7. विशाल नाथ, दिनेश कुमार पाण्डेय, दीना नाथ सिंह अजय मिश्र एवं मुहम्मद मुस्तफा, २०१२. उद्यान विज्ञानं के मौलिक सिद्धान्त, सतीश सीरियल पब्लिशिंग हाउस दिल्ली ।

This course can be opted as an elective by the students of following subjects: Open for all

Suggested Continuous Evaluation Methods:

Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.

Part B (5 marks): Class Interaction/Teacher Assessment

Course prerequisites: Nil.

Suggested equivalent online courses:

- Courses running in all the Agricultural Colleges/Institutes/Universities.

Certificate in Horticulture

First Year, Sem. II
Course II (Practical)

Programme/Class: Certificate	Year: First	Semester: Second
Subject: Horticulture		
Course Code: A470202P	Course Title: Nursery Management	
Course outcomes:		
1) The student will be able to understand basis of plant propagation and nursery management techniques. 2) Knowledge of nursery establishment and nursery rules and regulation. 3) Can demonstrate advanced propagation methods of horticultural crops.		
Credits: 2	Core Compulsory / Elective	
Max. Marks: 25+75	Min. Passing Marks:	
Total No. of Lectures-Tutorials-Practical (in hours per week): 02		
Unit	Topics	No. of Lectures
I	Media for propagation of plants in nursery beds. Preparation of nursery beds and sowing of seeds. Raising of rootstocks.	7
II	Seed treatments for breaking dormancy.	8
III	Practicing different types of cuttings, layering, graftings and buddings.	8
IV	Visit of the commercial nurseries, seed production and seed processing plants.	7
Suggested Readings:		
1. Hudson T. Hartmann, Dale E. Kester, Fred T. Davies, Jr. and Robert L. Geneve. 2017. Plant Propagation- Principles and Practices (7th Edition). PHI Learning Private Limited, New Delhi-110001. 2. R. R. Sharma, 2002. Propagation of Horticultural Crops-Principles and Practices. Kalyani Publishers, New Delhi. 3. J. S. Bal, 1997. Fruit Growing, Kalyani Publishers, New Delhi. 4. आर. के. पाठक, २०११. फल वृक्ष प्रवर्धन, भारतीय कृषि अनुसन्धान परिषद् नई दिल्ली । 5. जीतेन्द्र सिंह, २०१८. आधारीय बागवानी, कल्याणी प्रकाशक लुधियाना । 6. आर. के. पाठक एवं सी. एम्. ओझा, २०११. फल विज्ञानं, भारतीय कृषि अनुसन्धान परिषद्		

नई दिल्ली ।

7. विशाल नाथ, दिनेश कुमार पाण्डेय, दीना नाथ सिंह अजय मिश्र एवं मुहम्मद मुस्तफा, २०१२. उद्यान विज्ञान के मौलिक सिद्धान्त, सतीश सीरियल पब्लिशिंग हाउस दिल्ली ।

This course can be opted as an elective by the students of following subjects: Open for all

Suggested Continuous Evaluation Methods: (25 marks)

Practical file evaluation. Main focus on presentation, content and use of proper technique/method. Viva

Course prerequisites: Nil.

Suggested equivalent online courses:

Courses running in all the Agricultural Colleges/Institutes/Universities.

Diploma in Horticulture
Second Year, Sem. III

Course I (Theory)

Programme/Class: Diploma	Year: Second	Semester: III
Subject: Horticulture		
Course Code: A470301T	Course Title: Preservation of Fruits and Vegetables	
<p>Course outcomes:</p> <ol style="list-style-type: none"> 1) Students will be able to understand the post harvest technology aspects, preservation methods, and preparation of value added products of fruits and vegetables. 2) Will gain skill in doing post harvest operations pertaining to Horticultural products. 3) Will gain skills to operate a small processing fruit and vegetable processing unit for self employment. 		
Credits: 6	Core Compulsory / Elective	
Max. Marks: 25+75	Min. Passing Marks:	
Total No. of Lectures-Tutorials-Practical (in hours per week): 6		
Unit	Topics	No. of Lectures
I	Importance and scope of fruit and vegetable preservation industry in India and losses in post-harvest operations.	12
II	Planning and establishment of processing plant.	11
III	Principles and methods of preservation, canning and bottling of fruits and vegetables.	11
IV	Methods of preparation of juices, squashes and syrups.	11
V	Methods of preparation of jam, jelly and marmalade.	11
VI	Preservation by sugar and chemicals: candies, preserves and chemical preservatives.	11
VII	Preservation with salt and vinegar: pickling, chutneys and sauces.	12
VIII	Government policy on import and export of processed fruits. Food laws.	11
<p>Suggested Readings:</p> <ol style="list-style-type: none"> 1. R. P. Srivastava, and Sanjeev Kumar. 2002. Fruits and Vegetable Preservation – Principles and Practice. International Book Distributing Co., Lucknow. 2. G. S. Siddappa, Girdhari Lal and G. L. Tandon. 1998. Preservation of Fruits and Vegetables. ICAR, New Delhi. 		

3. वी. के. त्रिपाठी, २०१८. फल- सब्जी तुडाई उपरांत प्रबंधन एवं प्रसंस्करण, कल्याणी प्रकाशक लुधियाना ।
4. जी. एस. सैनी, २०१०. आधुनिक फल एवं सब्जी परिरक्षण प्रौद्योगिकी, रामापब्लिशिंग हाउस मेरठ ।

This course can be opted as an elective by the students of following subjects: Open for all

Suggested Continuous Evaluation Methods:

Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.

Part B (5 marks): Class Interaction/Teacher Assessment

Course prerequisites: Nil.

Suggested equivalent online courses:

- Courses running in all the Agricultural Colleges/Institutes/Universities.

**Diploma in Horticulture
Second Year, Sem. IV**

Course I (Theory)

Programme/Class: Diploma	Year: Second	Semester: IV
Subject: Horticulture		
Course Code: A470401T	Course Title: Fruit Production	
Course outcomes: <ol style="list-style-type: none"> 1) At the end of the course the student will be able to practice the production technologies of fruit crops. 2) Can demonstrate important production techniques and diagnose problems in cultivation of fruit crops. 		
Credits: 4	Core Compulsory / Elective	
Max. Marks: 25+75	Min. Passing Marks:	
Total No. of Lectures-Tutorials-Practical (in hours per week): 4		
Unit	Topics	No. of Lectures
I	Importance and scope, area, production and export potential of fruit crops, varieties, climate and soil requirements, propagation techniques, planting density and systems, after care, training and pruning. Management of water, nutrient and weeds and harvesting methods, of the following crops:	8
II	Mango, banana, citrus	8
III	Papaya, guava, pomegranate	7
IV	Apple, pear, peach	7
V	Cherry, strawberry, almond,	8
VI	Bael, ber, aonla,	7
VII	Pineapple, jackfruit and litchi	7
VIII	Physiological disorders, important disease and insect pests of fruit crops.	8
Suggested Readings: <ol style="list-style-type: none"> 1. W. S. Dhillon, 2013. Fruit Production in India. Narendra Publishing House, New Delhi 2. T. K. Chattopadhyay, 1997. Text book on Pomology. Volume II Kalyani Publishers, New Delhi. 3. आर. के. पाठक एवं सी. एम्. ओझा, २०११. फल विज्ञानं, भारतीय कृषि अनुसन्धान 		

<p>परिषद् नई दिल्ली ।</p> <p>4. राम रोशन शर्मा, २०१७. आधुनिक फलोत्पादन, कल्याणी प्रकाशक लुधियाना ।</p> <p>5. बिजेन्द्र सिंह एवं अशोक कुमार चौहान, २०१८. उद्यान विज्ञान, कल्याणी प्रकाशक लुधियाना ।</p>
<p>This course can be opted as an elective by the students of following subjects: Open for all</p>
<p>Suggested Continuous Evaluation Methods:</p> <p>Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.</p> <p>Part B (5 marks): Class Interaction/Teacher Assessment</p>
<p>Course prerequisites: Nil.</p>
<p>Suggested equivalent online courses:</p> <ul style="list-style-type: none"> • Courses running in all the Agricultural Colleges/Institutes/Universities.

Diploma in Horticulture
Second Year, Sem. IV
Course III (Practical)

Programme/Class: Diploma	Year: Second	Semester: IV
Subject: Horticulture		
Course Code: A470402P	Course Title: Fruit Production	
Course outcomes:		
<ol style="list-style-type: none"> 1) At the end of the course the student will be able to practice the production technologies of fruit crops. 2) Can demonstrate important production techniques and diagnose problems in cultivation of fruit crops. 3) Student can establish a small fruit orchard of high yielding new variety with improved production technologies. 		
Credits: 2		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 2		
Unit	Topics	No. of Lectures
I	Planning and layout of orchard, tools and implements, identification of various horticultural crops, preparation of nursery beds, digging of pits for fruit plants.	8
II	Planting systems, training and pruning of orchard trees, preparation of fertilizer mixtures and application including bio-fertilizer in fruit crops.	7
III	Preparation and application of growth regulators, layout of different irrigation systems, identification and management of nutritional disorder in fruits.	8
IV	Maturity standards, harvesting, grading, packaging and storage. Visit to commercial orchards and diagnosis of maladies.	7
Suggested Readings:		
<ol style="list-style-type: none"> 1. W. S. Dhillon, 2013. Fruit Production in India. Narendra Publishing House, New Delhi. 2. T. K. Chattopadhyay, 1997. Text book on Pomology. Kalyani Publishers, New Delhi. 3. आर. के. पाठक एवं सी. एम्. ओझा, २०११. फल विज्ञान, भारतीय कृषि अनुसन्धान परिषद् नई दिल्ली । 4. राम रोशन शर्मा, २०१७. आधुनिक फलोत्पादन, कल्याणी प्रकाशक लुधियाना । 5. विजेंद्र सिंह एवं अशोक कुमार चौहान, २०१८. उद्यान विज्ञान, कल्याणी प्रकाशक लुधियाना । 		
This course can be opted as an elective by the students of following subjects: Open for all		
Suggested Continuous Evaluation Methods: (25 marks) Practical file evaluation. Main focus on presentation, content and use of proper technique/method. Viva		
Course prerequisites: Nil.		

Suggested equivalent online courses:

- Courses running in all the Agricultural Colleges/Institutes/Universities.

**Horticulture
Third Year, Sem. V
Course I (Theory)**

Programme/Class: Degree	Year: Third	Semester: V
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Subject: Horticulture		
Course Code: A470501T	Course Title: Vegetable Production	
Course outcomes:		
1) At the end of the course the students will gain knowledge on the scenario of vegetable cultivation, advanced production technologies and post harvest handling of vegetable crop. 2) Will gain skill on important cultivation techniques in vegetable crop.		
Credits: 5		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 5		
Unit	Topics	No. of Lectures
I	Importance and scope of vegetable crops in India and Uttar Pradesh in human nutrition and national economy. Preparation of kitchen gardens.	9
II	Description of varieties and hybrids, origin, climate and soil, nursery practices and transplanting, preparation of field and sowing/planting for direct sown and planted vegetable crops, production technologies, insect-pests and diseases, post-harvest technology and marketing of following vegetable crops:	8
III	Tomato, brinjal, chillies	10
IV	Okra, peas, cowpea	10
V	Cabbage, cauliflower, knolkhol, broccoli	10
VI	Spinach, garlic, onion, radish	10
VII	Carrot, turnip, potato	8
VIII	Cucurbits: Pumpkin, Bottle gourd, bitter gourd	10
Suggested Readings:		
1. B. R. Choudhary 2009. A Text Book on Production Technology of Vegetables. Kalyani Publishers. Ludhiana. 2. M. S. Dhaliwal, 2008. Handbook of Vegetable Crops. Kalyani Publishers. Ludhiana 3. आर्य प्रेम सिंह, २००३. व्यवसायिक सब्जियों का उत्पादन, कल्याणी प्रकाशक लुधियाना । 4. राजेंद्र कुमार शुक्ल, पी. के. शुक्ल एवं ए. के. पाण्डेय, २०१८. आधुनिक शाकोत्पदन, कल्याणी प्रकाशक लुधियाना । 5. दान सिंह एवं सत्य प्रकाश, २०१९. सब्जी एवं मसालें वाली फसलों की उत्पादन तकनीकी, कल्याणी प्रकाशक लुधियाना ।		

6. राज नारायण एवं अन्य, २०१८. सब्जी उत्पादन तकनीक, टुडे एवं टोमारो प्रिंटेर्स पब्लिशर्स नई दिल्ली ।

This course can be opted as an elective by the students of following subjects: Open for all

Suggested Continuous Evaluation Methods:

Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.

Part B (5 marks): Class Interaction/Teacher Assessment

Course prerequisites: Nil.

Suggested equivalent online courses:

Courses running in all the Agricultural Colleges/Institutes/Universities.

Horticulture
Third Year, Sem. V
Course II (Theory)

Programme/Class: Degree	Year: Third	Semester: V
Subject: Horticulture		
Course Code: A470502T	Course Title: Vegetable Seed Production	

Course outcomes:		
1) At the end of the course the students will gain knowledge on the scenario of vegetable seed industry, advanced production technologies and post harvest handling of vegetable seeds.		
2) Will gain skill on seed production, processing, packaging and marketing of important vegetable crop and establish a commercial seed production unit.		
Credits: 5		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 5		
Unit	Topics	No. of Lectures
I	Importance and scope of vegetable seed production in India. Principles of vegetable seed production.	10
II	Definition of seed, classes-types of seed.	8
III	Land requirements, climate, season, planting time, nursery management, seed rate, rouging, seed extraction and storage of following vegetable crops:	8
IV	Tomato, brinjal, chillies	10
V	Okra, peas and potato	9
VI	Cabbage, cauliflower, brocoly	10
VII	Onion, radish, carrot	10
VIII	Cucurbits: Pumpkin, Bottle gourd, bitter gourd	10
Suggested Readings:		
1. P. Hazra and M.G. Som, 2009. Vegetable Seed Production and Hybrid Technology. Kalyani Publishers, Ludhiana.		
2. B. S. Asati and Prabhakar Singh. 2020. Seed Production Technology of Vegetables. Daya Publishing House. New Delhi		
3. आर्य प्रेम सिंह, २००३. व्यवसायिक सब्जियों का उत्पादन, कल्याणी प्रकाशक लुधियाना।		
4. राजेंद्र कुमार शुक्ल, पी. के. शुक्ल एवं ए. के. पाण्डेय, २०१८. आधुनिक शाकोत्पदन, कल्याणी प्रकाशक लुधियाना।		
5. दान सिंह एवं सत्य प्रकाश, २०१९. सब्जी एवं मसाले वाली फसलों की उत्पादन तकनीकी, कल्याणी प्रकाशक लुधियाना।		
6. राज नारायण एवं अन्य, २०१८. सब्जी उत्पादन तकनीक, टुडे एवं टोमारो प्रिंटेर्स एवं पब्लिशर्स नई दिल्ली।		

This course can be opted as an elective by the students of following subjects: Open for all .

Suggested Continuous Evaluation Methods:

Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.

Part B (5 marks): Class Interaction/Teacher Assessment

Course prerequisites: Nil.

Suggested equivalent online courses:

Courses running in all the Agricultural Colleges/Institutes/Universities.

Horticulture
Third Year, Sem. V
Course III (Project)

Programme/Class: Degree	Year: Third	Semester: V
Subject: Horticulture		
Course Code: A470503R	Course Title: Commercial Horticultural Nursery	

Course outcomes:	
<ul style="list-style-type: none"> • Students can become eligible to undertake end to end technical and management aspects of a commercial nursery. • Can practice skills in various propagation methods and care of nursery plants. • Will gain ability to manage a commercial horticultural nursery business. 	
Credits: 3	Core Compulsory / Elective
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 3(6 hours)	
Unit	Topics
I	Nursery production of fruit crops: Raising of rootstocks, grafting and budding of rootstocks, management of grafted plants, plant certification, packaging and marketing, quality control. Nursery production of ornamentals: Production of plantlets, production of potted plants, management and maintenance, sale and marketing. Nursery raising/procurement and transplanting, management and maintenance of the vegetable crops
Suggested Readings:	
<ol style="list-style-type: none"> 1. Hudson T. Hartmann, Dale E. Kester, Fred T. Davies, Jr. and Robert L. Geneve. 2017. Plant Propagation- Principles and Practices (7th Edition). PHI Learning Private Limited, New Delhi-110001. 2. R. R. Sharma, 2002. Propagation of Horticultural Crops- Principles and Practices. Kalyani Publishers, New Delhi. 3. J. S. Bal, 1997. Fruit Growing, Kalyani Publishers, New Delhi. 4. आर. के. पाठक, २०११. फल वृक्ष प्रवर्धन, भारतीय कृषि अनुसन्धान परिषद्, नई दिल्ली । 5. जीतेन्द्र सिंह, २०१८. आधारीय बागवानी, कल्याणी प्रकाशक लुधियाना । 6. विशाल नाथ, दिनेश कुमार पाण्डेय, दीना नाथ सिंह अजय मिश्र एवं मुहम्मद मुस्तफा, २०१२ उद्यान विज्ञान के मौलिक सिद्धान्त, सतीश सीरियल पब्लिशिंग हाउस दिल्ली । 	
This course can be opted as an elective by the students of following subjects: Open for all	
Suggested Continuous Evaluation Methods:	
Projects file evaluation, presentation, content and proper use of research methodology. Viva-voce.	
Course prerequisites: Nil.	

Horticulture

Third Year, Sem. VI Course I (Theory)

Programme/Class: Degree	Year: Third	Semester: VI
Subject: Horticulture		
Course Code: A470601T	Course Title: Ornamental Horticulture and Landscape Gardening	

Course outcomes:		
1) At the end of this course, the students will be able to plan and design the garden of their own with all the elements of garden and principles.		
2) The student will gain skill in manual drawing and execution of garden and establish a flower nursery.		
Credits: 5		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 5		
Unit	Topics	No. of Lectures
I	History, definitions, scope of ornamental horticulture in India and Uttar Pradesh	10
II	Importance, classification, and general cultivation aspects for ornamental plants viz. Annuals, biennales and herbaceous perennials.	8
III	Introduction to bulbous ornamentals, shrubs, climbers, trees and indoor plants.	8
IV	Importance, design and establishment of garden features/components viz. hedge, edge, borders	10
V	Flower beds, fences, garden walls, gates and carpet bed.	10
VI	Shade garden, roof garden, terrace garden, rockery, fountains, avenue planting and children garden.	10
VII	Lawn types, establishment and maintenance.	9
VIII	Uses of vertical garden, art of making bonsai, culture of bonsai and maintenance.	10
Suggested Readings:		
1. A. K. Singh, 2006. Flower Crops: Cultivation and Management. New India publishing agency, Pitampura, New Delhi.		
2. J. S. Arora, 2006. Introductory Ornamental Horticulture, Kalyani Publishers, Ludhiana.		
7. अनिल कुमार सिंह, २००८. व्यवसायिक पुष्पोत्पादन, प्रकाशन निदेशालय, गोविन्द वल्लभ पन्त कृषि एवं प्रौद्योगिकी विश्वविद्यालय पन्त नगर, उत्तराखण्ड ।		
8. के. आर. मौर्या, २०१६. फूलों की व्यवसायिक खेती, दया पब्लिकेशन नई दिल्ली ।		
This course can be opted as an elective by the students of following subjects: Open for all		
Suggested Continuous Evaluation Methods:		
Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.		
Part B (5 marks): Class Interaction/Teacher Assessment		

Course prerequisites: Nil.

Suggested equivalent online courses:

- Courses running in all the Agricultural Colleges/Institutes/Universities.

**Horticulture
Third Year, Sem. VI
Course II (Theory)**

Programme/Class: Degree	Year: Third	Semester: VI
Subject: Horticulture		
Course Code: A470602T	Course Title: Commercial Floriculture	

Course outcomes:		
1) At the end of this course, the student will be able to practice production technology of cut flowers, loose flowers and growing commercial flowers.		
2) Student will become eligible to manage and establish a commercial floriculture unit.		
Credits:		Core Compulsory / Elective
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 5		
Unit	Topics	No. of Lectures
I	Scope and importance of commercial floriculture in India and Uttar Pradesh	8
II	Production techniques of commercial flower crops like rose and marigold for domestic and export market.	10
III	Production techniques of commercial flower crops like gladiolus and gerbera for domestic and export market.	10
IV	Production techniques of commercial flower crops like chrysanthemum and carnation for domestic and export market.	10
V	Production techniques of commercial flower crops like tuberose and dahlia for domestic and export market.	10
VI	Production techniques of commercial flower crops like jasmine and orchid for domestic and export market.	10
VII	Growing of flowers under protected environments such as glass house, plastic house etc.,	8
VIII	Postharvest technology of cut flowers in respect of commercial flower crops, dehydration technique for drying of flowers.	9
Suggested Readings:		
1. A. K. Singh, 2006. Flower Crops: Cultivation and Management. New India publishing Agency, Pitampura, New Delhi.		
2. J. S. Arora, 2006. Introductory Ornamental Horticulture, Kalyani Publishers, Ludhiana		
3. अनिल कुमार सिंह, २००८. व्यवसायिक पुष्पोत्पादन, प्रकाशन निदेशालय, गोविन्द वल्लभ पन्त कृषि एवं प्रौद्योगिकी विश्वविद्यालय पन्त नगर, उत्तराखण्ड।		
4. के. आर. मौर्या, २०१६. फूलों की व्यवसायिक खेती, दया पब्लिकेशन नई दिल्ली।		
This course can be opted as an elective by the students of following subjects: Open for all		
Suggested Continuous Evaluation Methods:		
Part A (20 marks): Seminar/Assignment on any topic of the above syllabus. Test with multiple choice questions / short and long answer questions.		

Part B (5 marks): Class Interaction/Teacher Assessment

Course prerequisites: Nil.

Suggested equivalent online courses:

- Courses running in all the Agricultural Colleges/Institutes/Universities.

**B. A. in Horticulture
Third Year, Sem. VI
Course III (Project)**

Programme/Class: Degree	Year: Third	Semester: VI
Subject: Horticulture		
Course Code: A470603R	Course Title: Processing of Fruits and Vegetables.	
Course outcomes:		
1) Students can become eligible to undertake end to end technical and management aspects of a		

fruits and vegetable processing unit for value addition.	
2) Can practice skills related to processing unit maintenance and production techniques of value added products.	
3) Will gain ability to manage a processing unit for the fruits and vegetable preservation.	
Credits: 3	Core Compulsory / Elective
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 3 (6 huors)	
Unit	Topics
	Planning and execution of a market survey, preparation of processing schedule, preparation of project module based on market information, calculation of capital costs, source of finance, assessment of working capital requirements and other financial aspects, identification of sources for procurement of raw material, production and quality analysis of fruits and vegetables products at commercial scale, packaging, labeling, pricing and marketing of product.
Suggested Readings:	
1. R. P. Srivastava, and Sanjeev Kumar. 2002. Fruits and Vegetable Preservation – Principles and Practice. International Book Distributing Co., Lucknow.	
2. Siddappaa, G. S., Girdhari Lal and G. L. Tandon. 1998. Preservation of Fruits and Vegetables. ICAR, New Delhi.	
3. वी. के. त्रिपाठी, २०१८. फल- सब्जी तुडाई उपरांत प्रबंधन एवं प्रसंस्करण, कल्याणी प्रकाशक लुधियाना।	
4. जी. एस. सैनी, २०१०. आधुनिक फल एवं सब्जी परिरक्षण प्रौद्योगिकी, रामा पब्लिशिंग हाउस मेरठ।	
This course can be opted as an elective by the students of following subjects: Open for all	
Suggested Continuous Evaluation Methods:	
Projects file evaluation, presentation, content and proper use of research methodology, Viva-voce.	
Course prerequisites: Nil.	