

H/HORT EL- 483

**Protected Cultivation of High
Value Horticultural Crops
(4 Sub modules)**

Credits: 0+20=20

Semester: VIII

1.Course No. H/HORT EL-483/1

Credits: 0+3=3

Title: Basic Principles of Protected Cultivation

Topics to be Covered

Sr. No.	Topics	Discipline
1	Important and scope and constraints for protected cultivation	Horticulture
2	World scenario and Indian perspectives	Horticulture
3	Erection of poly house	Agril. Engg.
4	Site of selection and preparation of site for green house erection	Agril. Engg.
5	Different types of cladding materials for greenhouse	Agril. Engg.
7	Climatic control devices	Horticulture
8	Importance of media, type, characteristics of green house media	Horticulture
9	Irrigation and fertigation system.	Agril. Engg.
10	Different structure and specification of green house	Horticulture
11	Different types of green house and shade house.	Horticulture
12	Preparation media, sterilization , bed preparation	Horticulture
13	Govt. scheme, NHB scheme, finance and insurance for protected cultivation.	Horticulture

2.Course No. H/HORT EL-483/2

Credits: 0+5=5

Title: protection technology of vegetables under protected cultivation.

Topics to be Covered

Sr. No.	Topics	Discipline
1	Production technology of vegetables (Any two)	Horticulture
	Capsicum	
	Cucumber	
	Cherry tomato	
	Gherkin	
	Broccoli	
2	Off season cultivation of vegetables	Horticulture
3	Disease management	Pathology
4	Pest management	Entomology
5	Harvesting, pre-cooling, grading, packing, storage, transport, and marketing of vegetables	Horticulture
6	Climatic control measures in greenhouse/shade house for above vegetables	Horticulture
7	Market study	Economics
8	Survey	Economics
9	Domestic market	Economics
10	Exports	Economics
11	Economics of production and cost benefit ratio of above vegetables	Economics
12	Visit to export house	Horticulture
13	Report writing and viva-voca	Horticulture

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3.Course No. H/HORT EL-483/3

Title: Production technology of flower crops under Greenhouse.

Credits: 0+6=6

Topics to be Covered

Sr. No.	Topics	Discipline
1	Production technology of cut flower crops	Horticulture
	Rose	Horticulture
	Carnation	Horticulture
	Chrysanthemum	Horticulture
	Gerbera	Horticulture
2	Disease management of above crops	Pathology
3	Pest management of above crops	Entomology
4	Post harvest technology : harvesting, pre-cooling, grading, packaging, storage, transport and marketing of cut flowers	Horticulture
5	Climate control measures in Greenhouse	Horticulture
6	Market study: survey- domestic and export markets.	Economics
7	Economics of production and cost benefit ratio	Economics
8	Visit to export houses of cut flowers and auction centre	Horticulture
9	Report writing and viva-voce	Horticulture

4.Course No. H/HORT EL-483/4

Credits: 0+6=6

Title: Production technology of flower crops under Greenhouse.

Topics to be Covered

Sr. No.	Topics	Discipline
1	Production technology of flower crops	Horticulture
	Heliconia/Bird of paradise	Horticulture
	Anthurium	Horticulture
	Orchids	Horticulture
2	Disease management of above crops	Pathology
3	Pest management of above crops	Entomology
4	Post harvest technology : harvesting, pre-cooling, grading, packaging, storage, transport and marketing of cut flowers	Horticulture
6	Climatic control measures	Horticulture
9	Market study: survey for domestic and export markets.	Economics
10	Economics of production and cost benefit ratio	Economics
11	Visit to production and export unit.	Horticulture
12	Report writing and viva-voca	Horticulture

College of Horticulture, Akola

Semester : VIII Class : Sr. B. Sc. (Hort.) Credits : (0 + 20)

H/HORT EL-483 Experiential learning in "Protected cultivation of high value horticultural crops"

Subject wise credit distribution :

Subject	Credits
Horticulture	14
Agril. Engg.	2
Economics	2
Entomology	1
Pathology	1

Distribution of marks (Subject wise)

Sr. No.	Particular	Mark distribution					Total Marks
		Hort (0+14)	Econ (0+2)	Agril. Engg. (0+2)	Ento (0+1)	Path (0+1)	
1	Attendance (10%)	70	10	10	5	5	100
2	Diary (10%)	70	10	10	5	5	100
3	Preparation of project report (10%)	70	10	10	5	5	100
4	Practical examination/ Demonstration (20%)	140	20	20	10	10	200
5	Work performed (40 %)	280	40	40	20	20	400
6	Viva-voce (10 %)	70	10	10	5	5	100
	Total	700	100	100	50	50	1000

College of Horticulture, Akola
 Semester : VIII Class : Sr. B. Sc. (Hort.) Credits : (0 + 20)
 H/HORT-484 Experiential learning in "Post harvest and value addition"

Subject wise credit distribution :

Subject	Credits
Horticulture	15
Agril. Engg.	2
Economics	1
Chem	1
Pathology(Mibo)	1

Distribution of marks (Subject wise)

Sr. No.	Particular	Mark distribution					Total Marks
		Hort (0+15)	Agril. Engg. (0+2)	Econ (0+1)	Chem (0+1)	Mibo (0+1)	
1	Attendance (10%)	75	10	5	5	5	100
2	Diary (10%)	75	10	5	5	5	100
3	Preparation of project report (10%)	75	10	5	5	5	100
4	Practical examination/ Demonstration (20%)	150	20	10	10	10	200
5	Work performed (40 %)	300	40	20	20	20	400
6	Viva-voce (10 %)	75	10	5	5	5	100
	Total	750	100	50	50	50	1000

H/HORT EL - 484

**Post Harvest Handling and
Value Addition
(4 Sub Modules)**

Credits : 0+20=20

Semester: VIII

Course No. H/HORT EL-484/1

Title: Basic Principles for Development of Processing unit

Credits: 0+4=4

Topics to be Covered

Sr. No.	Topics	Discipline
1	Current status and importance of post harvest technology of fruits and vegetables of value addition in Maharashtra and India for fruits and vegetables base processed products	Horticulture
2	Site of selection for processing unit.	Horticulture
3	Study of design of processing	Horticulture
4	Layout of pilot processing plant for fruit beverages	Agril. Engg.
5	Sorting, grading and packaging house for fruit/vegetables.	Agril. Engg.
6	Survey of processing units in the city and districts, collection of information.	Economics
7	Design of processing plants- small scale and large scale industries.	Agril. Engg.
8	Design for post harvest sorting, grading and packaging units for fruits/vegetables.	Agril. Engg.
9	Design for cold storage, refrigerated vans, cool chain	Agril. Engg.
10	Identification and use of tools and equipments required for processing, packaging, etc.	Horticulture
11	Studies of equipments required for processing, their capacity, cost and maintenance for fruit beverages	Horticulture
12	Project report	Horticulture

Course No. H/HORT EL-484/2

Title: Basic Principles for pre and post Harvest Management

Credits:0+2=2

Topics to be Covered

Sr. No.	Topics	Discipline
1	Structure and composition of fruits and vegetables	Horticulture
2	Maturity indices, harvesting, grading of fruits/vegetables.	Horticulture
3	Physiological processes drying ripening of fruits/deterioration of vegetables.	Horticulture
4	Pre and post harvest practices to extend shelf life of fruits and vegetables.	Horticulture
5	Quality standards of fruit and vegetable processing	Horticulture
6	Procurement of raw material as per standards of processing	Horticulture
7	Post harvest handling, grading, packing, cool chain, transportation and storage of fresh produce.	Horticulture
8	Post harvest practices for extending shelf life of various fruits/vegetables wax coating, grape guards vapour heat treatment, ethylene absorbents, shrink wrapping, irradiation, hot water treatment, blanching, MCP-1 chemical etc.	Horticulture
9	Post harvest handling, sorting, grading, packaging and transportation through cool chain.	Horticulture
10	Determination of respiration rates, ethylene evolution	Horticulture
11	Studies on storage disorder	Horticulture
12	Visit to different cold storage.	Horticulture

Course No. H/HORT EL-484/3

Credits: 0+6=6

Title: Value Addition and Processing of Horticultural Crops.

Topics to be Covered

Sr. No.	Topics	Discipline
1	Beverages: importance of fruit and vegetables based beverages types, nutritional and medicinal Importance, market potential etc. Carbonated beverages, case study of processing unit.	Horticulture
2	Preparation of various beverage including wine juice, squash, syrup, cordial etc.	Horticulture
3	Preparation of jam jellies, marmalade of important fruit	Horticulture
4	Preparation of lime, mango and vegetable pickle.	Horticulture
5	Preparation of dehydrated products cadies-ber, anola.	Horticulture
6	Preparation of different beverages juice, squash, syrup, cordial, carbonated fruit juice, drinks and wines etc.	Horticulture
7	Preparation of fruit jam mixed jam jellies and marmalades	Horticulture
8	Preparation of various tomato products like juice, ketchup, paste, puri, sauce-hot and sweet etc.	Horticulture
9	Preparation of dehydrated products- dried onion ,okra, leafy vegetable, chiku flakes, potato chips, ber, and aonla candy etc.	Horticulture
10	Preparation of pickles lime, mango, karonda and different vegetables.	Horticulture
11	Working out economics of preparation of products	Economics

Course No. H/HORT EL-484/4

Credits:0+3=3

Title: Quality Assurance Techniques of fresh and processed Products.

Topics to be Covered

Sr. No.	Topics	Discipline
1	Quality control management in processing.	Chem/Mibo
2	Packaging – Importance, Principles, types, etc. botting, corking, sealing, labeling, aspectic packaging and storage	Horticulture
3	Quality assurance, analytical tools, hygiene, machinery and maintenance	Chem
4	HACCP, International Standards FPO liscence, PFA standards, Codex Standards	Horticulture
5	Sales promotion, certification, distribution, and marketing, banking, finance and institutional management	Economics
6	Assessment of quality of processed products e.g. microbial and nutritional i.e. estimation of vit. A,C, and sugar, acidity, T.S.S.	Mibo/Chem
7	Packaging – botting, corking, labeling, sterilization, pasteurization and storage.	Horticulture
8	Post storage quality assessment of different stored product- microbial and nutritional (analytical exercise)	Chem/Mibo
9	Studies on government and other agencies required for various certification, licence and finance	Horticulture
10	Market survey of preserved products- scope and constraint and problems	Econ
11	Report writing.	Horticulture