INTRODUCTION

The SRTMUN is gearing up for several initiatives towards academic excellence, quality improvement and administrative reforms. In view of this priority and in-keeping with Vision and Mission; process was already initiated towards introduction of semester system, grading system and credit system. In the recent past, University had already implemented Credit based grading system to campus schools and Choice Based Credit System (**CBCS**) pattern for PG in all the affiliated colleges from the academic year **2014-2015.** These regulations shall be called as Choice Based Course Credit System & Grading, 2014. In short it will be referred as **SRTMUN CBCS REGULATION**.

Now University is going one step ahead to implement Choice Based Credit System (**CBCS**) pattern at UG level from the academic year **2016-2017** progressively for B.Sc. first year, second year and third year respectively. Revision and updating of the curriculum is the continuous process to provide an updated education to the students at large. Presently there is wide diversity in the curriculum of different Indian Universities which inhibited mobility of students in other universities or states. To ensure and have uniform curriculum at UG and PG levels as per the **SRTMUN CBCS REGULATION**, curriculum of different Indian Universities, syllabus of NET, SET, MPSC, UPSC, Forest Services and the UGC model curriculum are referred to serve as a base in updating the same.

The B.Sc. Horticulture (General) semester pattern course is running in different affiliated colleges of the SRTMUN. The course content has been designed under CBCS pattern. The course content of each theory paper is divided into units by giving appropriate titles and subtitles. For each unit, total number of periods required, weight age of maximum marks and credits are mentioned. A list of practical exercises and skills for laboratory work to be completed in the academic year is also given. A list of selected reading material and a common skeleton question paper for all papers of semester-I, II, III, IV, V&VI are also provided at the end of the syllabus.

OBJECTIVES

1. To provide an updated education to the students at large in order to know the importance and scope of the discipline and to provide mobility to students from one university or state to other.
2. To update curriculum by introducing recent advances in the subject and enable the students to face NET, SET, UPSC and other competitive examinations successfully.
3. To impart knowledge of plant science as the basic objective of Education
4. To develop a scientific attitude to make students open minded, critical and curious
5. To develop an ability to work on their own and to make them fit for the society
6. To expose themselves to the diversity amongst life forms
7. To develop skill in practical work, experiments, equipments and laboratory use along with collection and interpretation of plant materials and data
8. To make aware of natural resources and environment and the importance of conserving the same
9. To develop ability for the application of the acquired knowledge in the fields of life so as to make our country self reliant and self sufficient
10. To appreciate and apply ethical principles to plant science research and studies

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SEMESTER PATTERN CURRICULUM UNDER CHOICE BASED CREDIT SYSTEM (CBCS) PATTERN FOR

Faculty of Science

Under Graduate (UG) Programmes

SUBJECT: HORTICULTURE

CLASS: B. Sc. FIRST YEAR

An Outline:

Semester/ Annual	Course Name		Paper No. & Title	Total Periods (periods/ week)	Marks for		Credits (Marks)
					External (ESE)	Internal (CA)	
Semester-I	CCH-I	Section-A	**Theory Paper-I:** Fundamentals of Horticulture	45 (03/week)	40	10	Credits: 02 (Marks:50)
		Section-B	**Theory Paper-II:** Propagation and Nursery Management	45 (03/week)	40	10	Credits: 02 (Marks:50)
Semester-II	CCH-II	Section-A	**Theory Paper-III:** Production Technology of Tropical And Sub-Tropical Fruit Crops	45 (03/week)	40	10	Credits: 02 (Marks:50)
		Section-B	**Theory Paper-IV:** Production Technology of Arid, Minor and Plantation Crops	45 (03/week)	40	10	Credits: 02 (Marks:50)
Annual pattern	CCHP-I		**Practical Paper-V:** Practicals based on theory papers of CCH-I&II	24 Prac. (03/week/ batch)	80	20	Credits: 04 (Marks:100)
				Total	**240**	**60**	**Credits: 12 (Marks:300)**

CCH: Core Course Horticulture, **CCHP:** Core Course Horticulture Practical, **ESE:** End of semester examination, **CA:** Continuous Assessment

Distribution of marks: 80% of the total marks for ESE and 20% for CA

- **CA of Marks-10:** 05 marks for Test/ Assignments & 05 marks for attendance
- **CA of Marks-20:** 10 marks for Test/ Assignments & 10 marks for attendance

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SUBJECT: HORTICULTURE

CLASS: B. Sc. SECOND YEAR

An Outline:

Semester/ Annual	Course Name		Paper No. & Title	Total Periods (periods/ week)	Marks for		Credits (Marks)
					External (ESE)	Internal (CA)	
Semester-III	CCH-III	Section-A	**Theory Paper-VI:** Production Technology of Vegetable Crops-I	45 (03/week)	40	10	Credits: 02 (Marks:50)
		Section-B	**Theory Paper-VII:** Production Technology of Vegetable Crops-II	45 (03/week)	40	10	Credits: 02 (Marks:50)
Semester-IV	CCH-IV	Section-A	**Theory Paper-VIII:** Ornamental and Landscape Gardening	45 (03/week)	40	10	Credits: 02 (Marks:50)
		Section-B	**Theory Paper-IX:** Commercial Floriculture	45 (03/week)	40	10	Credits: 02 (Marks:50)
Annual pattern	CCHP-II	Section-A	**Practical Paper-X:** Practicals based on theory papers-VI& VII	12 Prac. (03/week/ batch)	40	10	Credits: 02 (Marks:50)
		Section-B	**SEC-I: (1 Skill/Optional)**	(03/week/ batch)	--	50*	Credits: 02* (Marks:50)
Annual pattern	CCHP-III	Section-A	**Practical Paper-XI:** Practicals based on theory papers-VIII& IX	12 Prac. (03/week/ batch)	40	10	Credits: 02 (Marks:50)
		Section-B	**SEC-II: (1 Skill/Optional)**	(03/week/ batch)	--	50*	Credits: 02* (Marks:50)
Total Credits Semester-III and IV					**240**	**60 (100*)**	**Credits: 12 (04*) (Marks:300) (marks:100*)**

CCH: Core Course Horticulture, **CCHP:** Core Course Horticulture Practical, **ESE:** End of semester examination, **CA:** Continuous Assessment, **SEC:** Skill Enhancement Course, ***:** Credits/three options

Distribution of credits: 80% of the total credits for ESE and 20% for CA

- **CA of Marks-10:** 05 marks for Test/ Assignments & 05 marks for attendance
- **SEC of Marks 50*:** 15marks /1skill/optional & 05 marks for attendance/three options i.e. 50/3= 15 +5 (for attendance/ three options)

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Under Graduate (UG) Programmes

SUBJECT: HORTICULTURE

CLASS: B. Sc. THIRD YEAR, An Outline:

Semester/ Annual	Course Name		Paper No. & Title	Total Periods (periods/ week)	Marks for		Credits (Marks)
					External (ESE)	Internal (CA)	
Semester-V	DSEH-V	Section-A	**Theory Paper-XII:** Production Technology of Spice and Condiment crops	45 (03/week)	40	10	Credits: 02 (Marks:50)
		Section-B	**Theory Paper-XIII:** Production Technology of Medicinal and Aromatic plants	45 (03/week)	40	10	Credits: 02 (Marks:50)
Semester-VI	DSEH-VI	Section-A	**Theory Paper-XIV:** Post Harvest and Handling of Horticultural crops	45 (03/week)	40	10	Credits: 02 (Marks:50)
		Section-B	**Theory Paper-XV:** Processing and Preservation Technology	45 (03/week)	40	10	Credits: 02 (Marks:50)
Annual pattern	DSEHP-I	Section-A	**Practical Paper-XVI:** Practicals based on theory papers-XII&XIII	12 Prac. (03/week/ batch)	40	10	Credits: 02 (Marks:50)
		Section-B	**SEC-III: (1 Skill/Optional)**	01 Skill (03/week/ batch)	--	50*	Credits: 02* (Marks:50)
Annual pattern	DSEHP-II	Section-A	**Practical Paper-XVII:** Practicals based on theory papers-XIV&XV	12 Prac. (03/week/ batch)	40	10	Credits: 02 (Marks:50)
		Section-B	**SEC-IV: (Project)**	(03/week/ batch)	--	50*	Credits: 02* (Marks:50)
Total Credits Semester-V and VI					**240**	**60 (100*)**	**Credits: 12 (Marks:300) Credits: (04*) (Marks:100*)**

CCH: Core Course Horticulture, **CCHP:** Core Course Horticulture Practical, **ESE:** End of semester examination, **CA:** Continuous Assessment, **SEC:** Skill Enhancement Course, **DSEH:** Discipline Specific Elective Horticulture, **DSEHP:** Discipline Specific Elective Horticulture Practical, *: Credits/three options

Distribution of credits: 80% of the total credits for ESE and 20% for CA

- **CA of Marks-10:** 05 marks for Test/ Assignments & 05 marks for attendance
- **SEC –III of Marks 50*:** 15marks /1skill/optional & 05 marks for attendance/three options i.e. 50/3= 15 +5 (for attendance/ three options)
- **SEC –IV (Project) of Marks 50*:** 50 marks /project/optional

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Under Graduate (UG) Programmes

SUBJECT: HORTICULTURE

CLASS: B. Sc. FIRST YEAR, SEMESTER–I

CORE COURSE HORTICULTURE (CCH)-I

SECTION-A

(THEORY PAPER–I: FUNDAMENTALS OF HORTICULTURE)

Periods: 45 **Credits: 02 (Maximum Marks: 50)**

UNIT-I: Introduction to Horticulture *(10 periods)*

Definition, branches, scope and economic importance of horticultural crops; Nutritive value of fruits and vegetables; Classification of horticultural crops based on climatic requirements, season of growth, plant parts used for consumption and botanical classification; Horticultural zones of India and Maharashtra

UNIT-II: Principles of Horticulture *(13 periods)*

Soil and climatic requirements of horticultural crops; Selection of site for establishment of orchard; Planning, layout and planting of orchard; Bearing habit, fruit bud differentiation and flower and fruit drop; Training and pruning; Fruitfulness and unfruitfulness; Cropping system

UNIT-III: Management Horticulture *(12 periods)*

Orchard management; Nutrition management; Water management; Weed management; Plant protection

UNIT-IV: Applied Horticulture *(10 periods)*

Study of plant growth regulators (Mechanism of action and biological effect): Auxins, Gibberellins, Cytokinins, Ethylene; **Special horticultural practices:** Fruit crops-Bahar treatment, girdling, notching, ringing and bending; Vegetable crops-Earthing up, staking and blanching; Flower crops-Pinching, disbudding and deshooting

CLASS: B. Sc. FIRST YEAR, SEMESTER–I
CORE COURSE HORTICULTURE (CCH)-I
SECTION-B
(THEORY PAPER–II: PROPAGATION AND NURSERY MANAGEMENT)

Periods: 45 **Credits: 02 (Maximum Marks: 50)**

UNIT-I: Propagation *(13 periods)*

Basic concept, types of plant propagation along with merits and demerits; Seed treatment, seed germination and seed dormancy; Polyembryony and apomixes; Stock - scion relationship; Factors affecting Budding and grafting

UNIT-II: Common origin methods of propagation *(12 periods)*

Cutting-Root cutting, Stem cutting and Leaf cutting; **Layering-**Simple layering, Air layering, Mound layering; **Specialized structures**-Bulbs, Tubers and Rhizomes

UNIT-III: Separate origin methods of propagation (*10 periods)*

Budding- Shield budding, Patch budding and Ring budding; **Grafting-**Simple grafting, Tongue grafting and Veneer grafting

UNIT-IV: Nursery Management *(10 periods)*

Definition, importance, scope and types of nursery management; Site selection; Components and layout of nursery; Media containers and propagation structures; after care of nursery; Nursery Act

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CLASS: B. Sc. FIRST YEAR, SEMESTER–II

CORE COURSE HORTICULTURE (CCH)-II

SECTION-A

(THEORY PAPER–III: PRODUCTION TECHNOLOGY OF TROPICAL AND SUB-TROPICAL FRUIT CROPS)

Periods: 45 **Credits: 02 (Maximum Marks: 50)**

UNIT-I: Introduction to tropical and sub-tropical fruit crops *(10 periods)*

Importance of tropical and sub tropical fruit growing in India and Maharashtra; Nutritive value of tropical and sub tropical fruits; Area and production of India and Maharashtra; Exports and imports of fruits in India; Constraints in fruit production and remedies to overcome them

UNIT-II: Cultivation practices of tropical fruit crops *(13 periods)*

Origin, history, distribution, area and production, uses and composition, varities, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield, disease and pests of tropical fruit crops – Banana, Guava, Papaya and Sapota

UNIT – III: Cultivation practices of sub-tropical fruit crops *(12 periods)*

Origin, history, distribution, area and production, uses and composition, varities, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of sub-tropical fruit crops -Kagzi lime, Sweet orange, Mandarin, Grapes, Mango and Pomegranate

UNIT-IV: Fruit physiology *(10 periods)*

Study of major physiological disorders: Mango- Alternate bearing and Spongy tissue; Citrus- Granulation and Gummosis; Grapes- Bareness; Pomegranate- Fruit cracking

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CLASS: B. Sc. FIRST YEAR, SEMESTER–II

CORE COURSE HORTICULTURE (CCH)-II

SECTION-B

(THEORY PAPER–IV: PRODUCTION TECHNOLOGY OF ARID, MINOR AND PLANTATION CROPS)

Periods: 45 **Credits: 02 (Maximum Marks: 50)**

UNIT-I: Introduction to arid, minor and plantation crops *(10 periods)*

Importance of arid, minor and plantation fruit crops growing in India and Maharashtra; Nutritive value of arid, minor and plantation fruit crops; Area and production of India and Maharashtra; Exports and imports of arid, minor and plantation fruits in India; Constraints in arid, minor and plantation production and remedies to overcome them

UNIT – II: Cultivation practices of arid fruit crops *(10 periods)*

Origin, history, distribution, area and production, uses and composition, varities, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of arid fruit crops- Aonla, Ber, Custard Apple, Fig andTamarind

UNIT – III: Cultivation practices of minor fruit crops *(13 periods)*

Origin, history, distribution, area and production, uses and composition, varities, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of minor fruit crops- Jamun, Bael, Wood apple,

UNIT – IV: Cultivation practices of plantation crops *(12 periods)*

Origin, history, distribution, area and production, uses and composition, varities, soil andclimatic requirements, propagation, planting, training and pruning, manuring and, fertilizer application, irrigation, intercropping, harvesting and yield disease and pests and processing of plantation crops-Coconut, Cashewnut, Tea and Coffee

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CLASS: B. Sc. FIRST YEAR

ANNUAL PATTERN

CORE COURSE HORTICULTURE PRACTICAL (CCHP)-I

(PRACTICAL PAPER–V: BASED ON THEORY PAPER-I, II, III&IV)

Practicals: 24 **Credits: 04 (Maximum Marks: 100)**

Practical Exercises:

Practical 1: Introduction to fruit crops
Practical 2: Study of garden tools and implements
Practical 3: Study of different media, containers and potting and repotting
Practical 4: Preparation of nursery beds and raising of nursery seedlings
Practical 5: Layout of square system of planting
Practical 6: Layout of diagonal system of planting
Practical 7: Layout of rectangular system of planting
Practical 8: Layout of hexagonal system of planting
Practical 9: Layout of triangular system of planting
Practical 10: Study of different methods of cutting
Practical 11: Study of different methods of layering
Practical 12: Study of different methods of budding
Practical 13: Study of different methods of grafting
Practical 14: Study of different methods of training
Practical 15: Study of different methods of pruning
Practical 16: Study of application of plant growth regulators in horticultural crops
Practical 17: Study of manures and fertilizer application methods followed in horticultural crops
Practical 18: Study of irrigation methods followed in horticultural crops
Practical 19: Study of special horticultural practices followed in fruit crops
Practical 20: Identification and collection of important pests and diseases in fruit crops
Practical 21: Visit to a nursery unit
Practical 22-23: Visit to commercial orchards
Practical 24: Visit to a fruit market

Note: *Students should submit excursion report in detail in the practical examination for evaluation. The report shall carry marks*

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SUBJECT: HORTICULTURE

CLASS: B. Sc. FIRST YEAR

ANNUAL PATTERN

CORE COURSE HORTICULTURE PRACTICAL (CCHP)-I

(PRACTICAL PAPER–V: BASED ON THEORY PAPER-I, II, III&IV)

END OF SEMESTER EXAMINATION (ESE)

Skeleton question paper

Time: Four hours **Maximum Marks: 80**

Note: *(i) Attempt all questions*
(ii) Show your preparation to the examiner
(iii) Draw neat and well labelled diagrams wherever necessary

Q1.	Identify and describe the given **specimen- A and B** (Tropical fruit crops / Sub-Tropical fruit crops)	10
Q2.	Identify, and describe the given **specimen- C and D** (Arid fruit crops / Minor fruit crops / Plantation crops)	10
Q3.	Demonstrate the method of vegetative propagation of given **specimen E** (Cutting/ layering/ grafting/ budding)	10
Q4.	Draw a layout plan for planting in an orchard of given **specimen- F**	10
Q5.	Describe the method of irrigation in an orchard of given **specimen- G.**	10
Q6.	Describe the method of application of Manures / Fertilizers in an orchard of given **specimen-H**	10
Q7.	i. Record book	10
	ii. Submission	10