।। सा विद्या या विमुक्तये ।।
स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड
"ज्ञानतीर्थ" परिसर, विष्णुपूरी, नांदेड - ४३१६०६ (महाराष्ट्र)
SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED
"Dnyanteerth", Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)
Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'A' Grade
ACADEMIC (1-BOARD OF STUDIES) SECTION
Phone: (02462) 229542
Fax : (02462) 229574
Website: www.srtmun.ac.in
E-mail: bos.srtmun@gmail.com

संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील द्वितीय वर्षाचे **CBCS Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक २० जून २०२० रोजी संपन्न झालेल्या ४७व्या मा. विद्या परिषद बैठकीतील विषय क्र.११/४७–२०२०**च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील द्वितीय वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्यात येत आहेत.

1. B.Sc.-II Year-Biophysics	2. B.Sc.-II Year-Bioinformatics
3. B.Sc.-II Year-Biotechnology	4. B.Sc.-II Year-Biotechnology (Vocational)
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31. B.Sc.-II Year Statistics	32. B.Sc.-II Year-Zoology

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी.

'ज्ञानतीर्थ' परिसर,
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जा.क्र.: शैक्षणिक–१/परिपत्रक/पदवी–सीबीसीएस अभ्यासक्रम/२०२०–२१/**३३३**

दिनांक : १५.०७.२०२०.

स्वाक्षरित/–
उपकुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :
१) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
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५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
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दिनांक : १५.०७.२०२०.

स्वाक्षरित/–
उपकुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :
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६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

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

Faculty of Science & Technology
Under Graduate (UG) Programmes

CLASS: B.Sc. SECOND YEAR

SUBJECT: HORTICULTURE

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**. Similarly university had implemented Choice Based Credit System (**CBCS**) pattern at UG level from the academic year **2016-2017 progressively** (for B.Sc. first year from 2016-2017, for B.Sc. second year form 2017-2018 and for B.Sc. third year from 2018-2019 respectively).

Revision and updating of the curriculum is the continuous process to provide an updated education to the students at large. In view of this priority and in-keeping with Vision and Mission, process of revision and updating the curriculum is initiated and implemented at UG level from the academic year **2019-2020 progressively** (for B.Sc. first year from **2019-2020**, for B.Sc. second year form **2020-2021** and for B.Sc. third year from **2021-2022** respectively). 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 is mentioned. A list of practical exercises and skills for laboratory work to be completed in the academic year is also given. A common skeleton question paper for all the courses is also provided at the end of the syllabus.

SALIENT FEATURES:

The syllabus of B Sc II year Horticulture has been framed to meet the requirement of Choice based Credit System. The courses offered here in will train and orient the students in the field of Horticulture.

The Section-A of CCH-III&IV deals with production technology of vegetable crops. The Section-B of CCH-III&IV deals with ornamental and landscape gardening and commercial floriculture. This would help students to lay a strong foundation in the field of Horticulture.

The courses which deal with the environment and sustainability are Medicinal plants and Green House Cultivation. These courses create awareness about conservation of biodiversity and its relevance with the socio-economical and environmental aspects.

Overall after completion of this course, students will also acquire fundamental knowledge in Horticultural science and also understand that Horticulture is an integral part of the human life and developments.

CCHP-I Courses based on theory papers of CCH-III&IV offered during this program is designed with the aim of imparting specific practical knowledge to the students which will lead to the self employability through development of their own enterprises.

PROGRAM 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 Horticulture 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 develop skill in practical work and laboratory use.
7. To develop ability for the application of the acquired knowledge in the Horticulture.
8. To appreciate and apply ethical principles to Horticultural research and studies.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

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Under Graduate (UG) Programmes

CLASS: B.Sc. SECOND YEAR

SUBJECT: HORTICULTURE

PROGRAM OUTCOMES:

1. This program will train and orient the students in the field of Horticulture and Agriculture.
2. This will help the students for their career development.
3. Practical Courses offered during this program will provide additional specific knowledge to the students for self employability through the development of their own enterprises.

PREREQUISITE:

The optional courses are offered to the students registered for undergraduate programs. Such students should have the basic knowledge of Horticultural science and willing to gain additional knowledge in the field of Horticulture.
Admissions to this program are given as per the University rules.

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Faculty of Science & Technology

Under Graduate (UG) Programmes

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SUBJECT: HORTICULTURE

Class –B. Sc. First year: An outline (w.e.f. Academic year 2019-2020)

Semester/ Annual	Course No.	Course Name	Instruction Hrs / week	Total Periods	Marks for		Credits (Marks)
					Internal (CA)	External (ESE)	
Semester-I	CCH-I	**CCH-I (Section-A):** Fundamentals of Horticulture **(Theory Paper-I)**	03	45	10	40	Credits: 02 (Marks:50)
		CCH-I (Section-B): Propagation and nursery management **(Theory Paper-II)**	03	45	10	40	Credits: 02 (Marks:50)
Semester-II	CCH-II	**CCH-II (Section-A):** Production technology of tropical and sub tropical fruit crops **(Theory Paper-III)**	03	45	10	40	Credits: 02 (Marks:50)
		CCH-II (Section-B): Production technology of arid, minor and plantation crops **(Theory Paper-IV)**	03	45	10	40	Credits: 02 (Marks:50)
Annual Pattern	CCHP-I	**CCHP-I:** Practicals based on theory papers of CCH-I&II **(Practical Paper-V)**	03	24 Practicals/ Batch/year	20	80	Credits: 04 Marks:100)
Total Marks &Credits Semester-I and II					**Marks: 60**	**Marks: 240**	**Credits:12 Marks:300**

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

CA: Continuous Assessment

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

- **CA of 10 Marks:** 05 marks for Test and 05 marks for home assignments
- **CA of 20 Marks:**10 marks for test & 10 marks for Record book and excursion report at the time of practical examination

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Faculty of Science & Technology

Under Graduate (UG) Programmes

CLASS: B.Sc. SECOND YEAR

SUBJECT: HORTICULTURE

Class –B. Sc. Second year: An outline (w.e.f. Academic year 2020-2021)

Semester/ Annual	Course No.	Course Name	Instruction Hrs/week	Total Periods	Marks for		Credits (Marks)
					Internal (CA)	External (ESE)	
Semester-III	CCH-III	**CCH-III (Section-A):** Production Technology of Vegetable Crops-I **(Theory Paper-VI)**	03	45	10	40	Credits: 02 (Marks:50)
		CCH-III (Section-B): Ornamental and Landscape Gardening **(Theory Paper-VII)**	03	45	10	40	Credits: 02 (Marks:50)
Semester-IV	CCH-IV	**CCH-IV (Section-A):** Production Technology of Vegetable Crops-II **(Theory Paper-VIII)**	03	45	10	40	Credits: 02 (Marks:50)
		CCH-IV (Section-B): Commercial Floriculture **(Theory Paper-IX)**	03	45	10	40	Credits: 02 (Marks:50)
Annual Pattern	CCHP-II	**CCHP-II:** Practicals based on theory papers of **Section-A of CCH-III&IV(Practical Paper-X)**	03	16 Practicals/ Batch/ Year	10	40	Credits: 02 (Marks:50)
	SECH-I	**SECH-IA:**Green house (protected cultivation of plants-plasticulture) **OR** **SECH-IB:** Orchard layout and planting skill	03	45 (Theory periods-21/Year, Practicals-08/ year)	25	25	Credits: 02 (Marks:50)
Annual Pattern	CCHP-III	**CCHP-II:** Practicals based on theory papers of **Section-B of CCH-III&IV(Practical Paper-XI)**	03	16 Practicals/ Batch/ Year	10	40	Credits: 02 (Marks:50)
	SECH-II	**SECH-IIA:** Nursery establishment skill **OR** **SECB-IIB**: Fruit and vegetable preservation skill	03	45 (Theory periods-21/Year, Practicals-08/ year)	25	25	Credits: 02 (Marks:50)
Total Marks and Credits Semester-III & IV					**Marks: 110**	**Marks: 290**	**Credits: 16 Marks:400**

CCH: Core Course Horticulture, **CCHP:** Core Course Horticulture Practical, **ESE:**End of semester examination, **CA:** Continuous Assessment, **SECH:**Skill Enhancement Course Horticulture, **Distribution of credits:** 80% of the total credits for ESE and 20% for CA

CA of 10 Marks (Theory): 05 marks for Test and 05 marks for home assignments, **CA of 10 Marks (Practical):** 05 marks for test & 05 marks for Record book and excursion report at the time of practical examination, **CA of Marks 25:** 15 for marks Seminar & 10 marks for Test

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CLASS: B.Sc. SECOND YEAR

SUBJECT: HORTICULTURE

Class –B. Sc. Third year: An outline (w.e.f. Academic year 2021-2022)

Semester/ Annual	Course No.	Course Name	Instruction Hrs/week	Total Periods	Marks for		Credits (Marks)
					Internal (CA)	External (ESE)	
Semester-V	DSEH-I	**DSEH-I(Section-A):** Production Technology of Spices and Condiment Crops **(Theory Paper-XII)**	03	45	10	40	Credits: 02 (Marks:50)
		DSEH-I(Section-B): Post Harvest and Handling of Horticultural Crops **(Theory Paper-XIII)**	03	45	10	40	Credits: 02 (Marks:50)
Semester-VI	DSEH-II	**DSEH-II(Section-A):** Production Technology of Medicinal and Aromatic Plants **(Theory Paper-XIV)**	03	45	10	40	Credits: 02 (Marks:50)
		DSEH-II(Section-B): Processing and Preservation Technology **(Theory Paper-XV)**	03	45	10	40	Credits: 02 (Marks:50)
Annual Pattern	DSEHP-I	**DSEHP-I:** Practicals based on section-A of DSEH-I&II **(Practical Paper-XVI)**	03	16 Practicals/ Batch/ Year	10	40	Credits: 02 (Marks:50)
	SECH-III	**SECH-IIIA:** Medicinal plants **OR** **SECH-IIIB:** Biocontrol	03	45 (Theory periods-21/Year, Practicals-08/ year)	25	25	Credits: 02 (Marks:50)
Annual Pattern	DSEHP-II	**DSEHP-II:** Practicals based on section-B of DSEH-I&II **(Practical Paper-XVII)**	03	16 Practicals/ Batch/ Year	10	40	Credits: 02 (Marks:50)
	SECH-IV	**SECH-IVA**: Vermicompost **OR** **SECH-IVB:** Irrigation systems	03	45 (Theory periods-21/Year, Practicals-08/ year)	25	25	Credits: 02 (Marks:50)
Total Marks & Credits Semester-V and VI					**Marks: 110**	**Marks: 290**	**Credits: 16 Marks:400**

DSEH: Discipline Specific Elective Horticulture, **DSEHP:** Discipline Specific Elective Horticulture Practical, **ESE:**End of semester examination, CA**:** Continuous Assessment, **SECH:**Skill Enhancement Course Horticulture,

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SUBJECT: HORTICULTURE

SEMESTER–III

CCH-III (SECTION-A): PRODUCTION TECHNOLOGY OF VEGETABLE CROPS-I

(Theory Paper-VI)

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

LEARNING OBJECTIVES:

1. To know about importance, nutritive value, vegetable types and their classification.
2. To study cultivation of different groups of vegetables such as solanaceous, cucurbitaceous and leguminous vegetables.
3. To acquire knowledge of vegetable production technology.

LEARNING OUTCOMES:

1. The students will be able to understand importance, nutritive value, vegetable types and their classification.
2. Students will acquire knowledge of cultivation of different groups of vegetables.

UNIT –I: VEGETABLE CROPS (10 PERIODS)

1. Importance and scope of Olericulture
2. Nutritive value of vegetables
3. Classification of vegetables
4. Types of vegetable gardening

UNIT –II: SOLANACEOUS VEGETABLE 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 fruit vegetable crops mentioned below

1. Tomato
2. Brinjal
3. Potato

UNIT–III: CUCURBITACEOUS VEGETABLE 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 vegetable crops mentioned below

1. Bitter gourd
2. Ridge gourd
3. Cucumber

UNIT – IV: LEGUMINOUS VEGETABLE 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 vegetable crops mentioned below

1. Cluster bean
2. Garden pea
3. Methi (Fenugreek)

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CLASS: B.Sc. SECOND YEAR

SUBJECT: HORTICULTURE

SEMESTER–III

CCH-III (SECTION-B): ORNAMENTAL AND LANDSCAPE GARDENING

(Theory Paper-VII)

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

LEARNING OBJECTIVES:

1. To know about principles of ornamental and landscape gardening.
2. To study garden features, types and styles.
3. To acquire knowledge of ornamental and landscape gardening.

LEARNING OUTCOMES:

1. The students will be able to understand principles of ornamental and landscape gardening, garden features, types and styles.
2. Students will acquire knowledge of ornamental and landscape gardening.

UNIT – I: PRINCIPLES OF LANDSCAPE GARDENING (12 PERIODS)

1. Importance and scope of landscape gardening
2. History of landscape gardening
3. Art principles
4. Some important terms of landscape gardening
5. Garden adornments

UNIT – II: GARDEN FEATURES –I (10 PERIODS)

1. Walls
2. Fencing
3. Steps
4. Garden
5. Garden drives and paths
6. Hedges
7. Edges
8. Arches
9. Pergola
10. Lawn

UNIT – III: GARDEN FEATURES -II (10 PERIODS)

1. Carpet bedding
2. Flower beds
3. Shrubbery
4. Borders
5. Rockery
6. Water gardens
7. Bonsai
8. Topiary

UNIT – IV: GARDEN TYPES AND STYLES (13 PERIODS)

- **Garden types**
  1. Indoor garden
  2. Outdoor garden
- **Garden styles**
  1. Formal gardens
  2. Informal gardens
  3. Freestyle gardens

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SUBJECT: HORTICULTURE

SEMESTER–IV

CCH-IV (SECTION-A): PRODUCTION TECHNOLOGY OF VEGETABLE CROPS-II

(Theory Paper-VIII)

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

LEARNING OBJECTIVES:

1. To know about importance, nutritive value, vegetable types and their classification.
2. To study cultivation of different groups of vegetables such as solanaceous, cucurbitaceous and leguminous vegetables.
3. To acquire knowledge of vegetable production technology.

LEARNING OUTCOMES:

1. The students will be able to understand importance, nutritive value, vegetable types and their classification.
2. Students will acquire knowledge of cultivation of different groups of vegetables.

UNIT –I: CRUCIFEROUS VEGETABLE CROPS (12 PERIODS)

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of vegetable crops mentioned below

1. Cabbage
2. Cauliflower
3. Radish

UNIT–II: MALVACEOUS AND CHENOPODIACEOUS VEGETABLE CROPS (10 PERIODS)

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of vegetable crops mentioned below

1. Okra (Bhendi)
2. Indian spinach
3. Beet root

UNIT–III: APIACEOUS AND MORINGACEOUS VEGETABLE CROPS (13 PERIODS)

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of underground vegetable crops mentioned below

1. Carrot
2. Anethum (Shepu)
3. Drumstick

UNIT – IV: AMARYLLIDACEOUS, AMERANTACEOUS AND CONVOLVULACEOUS VEGETABLE CROPS (10 PERIODS)

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of cruciferous vegetable crops mentioned below

1. Onion
2. Tandulja
3. Sweet potato

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SUBJECT: HORTICULTURE

SEMESTER–IV

CCH-IV (SECTION-B): COMMERCIAL FLORICULTURE

(Theory Paper-IX)

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

LEARNING OBJECTIVES:

1. To know about importance of commercial floriculture.
2. To study cultivation of different flowering plants of commercial importance
3. To acquire knowledge of cultivation of flowering plants of commercial importance.

LEARNING OUTCOMES:

1. The students will be able to understand importance commercial floriculture
2. Students will acquire knowledge of commercial floriculture.

UNIT–I: CULTIVATION PRACTICES – I (10 PERIODS)

Origin, history, area, production, economic importance, soil and climate, varieties, propagation, nursery raising, transplanting, manuring, irrigation, after care, plant protection, use of growth regulators, special horticultural practices, harvesting, post harvest handling, grading, packing, storage, transportation and marketing of following flowering plants

1. Rose
2. Jasmine
3. Tuberose

UNIT–II: CULTIVATION PRACTICES – II (10 PERIODS)

Origin, history, area, production, economic importance, soil and climate, varieties, propagation, nursery raising, transplanting, manuring, irrigation, after care, plant protection, use of growth regulators, special horticultural practices, harvesting, post harvest handling, grading, packing, storage, transportation and marketing of following flowering plants

1. Gladiolus
2. Carnation
3. Orchids

UNIT –III: CULTIVATION PRACTICES – III (13 PERIODS)

Origin, history, area, production, economic importance, soil and climate, varieties, propagation, nursery raising, transplanting, manuring, irrigation, after care, plant protection, use of growth regulators, special horticultural practices, harvesting, post harvest handling, grading, packing, storage, transportation and marketing of following flowering plants

1. Chrysanthemum
2. Aster
3. Marigold

UNIT –IV: CULTIVATION PRACTICES – IV (12 PERIODS)

Origin, history, area, production, economic importance, soil and climate, varieties, propagation, nursery raising, transplanting, manuring, irrigation, after care, plant protection, use of growth regulators, special horticultural practices, harvesting, post harvest handling, grading, packing, storage, transportation and marketing of following flowering plants

1. Gaillardia
2. Gerbera
3. Dahlia

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SUBJECT: HORTICULTURE

Skeleton Question Paper

(Theory papers)

Time: Two Hours **Maximum Marks:** 40

Note:

1. All questions carry equal marks.
2. Draw well labeled diagrams wherever necessary

Q1. Long answer type question (LATQ) **15 Marks**

OR

1. Short answer type question (SATQ) 08 Marks
2. Short answer type question (SATQ) 07 Marks

(This question will be based on any two units with equal weightage to each unit)

Q2. Long answer type question (LATQ) **15 Marks**

OR

1. Short answer type question (SATQ) 08 Marks
2. Short answer type question (SATQ) 07 Marks

(This question will be based on remaining two units with equal weightage to each unit excluding units used in question no 1)

Q3. Short note type question (SNTQ) on any two of the following **10 Marks**

a. Write short note on --- (Unit-I) 05 Marks

b. Write short note on --- (Unit-II) 05 Marks

c. Write short note on --- (Unit-III) 05 Marks

d. Write short note on --- (Unit-IV) 05 Marks

(Note: This question shall be on entire syllabus and must have one sub-question from each of the units)

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SUBJECT: HORTICULTURE

ANNUAL PATTERN

CCHP-II: PRACTICALS BASED ON SECTION-A OF CCH-III&IV

(Practical Paper-X)

Practical: 16 **Credits: 02 (Maximum Marks: 50)**

Practical Exercises:

1. Identification description of vegetable crops (**3 practicals**)
2. Preparation of nursery beds for raising the seedlings of vegetable crops **(1 practical**)
3. Transplantation of vegetable crops **(1 practical**)
4. Pre sowing seed treatments in vegetable crops (cold water/ hot water/acid/ chilling) **(2 practicals**)
5. Intercultural operations in vegetable crops **(2 practicals**)
6. Study of manures and fertilizers application in vegetable crops **(2 practicals**)
7. Study of irrigation methods in vegetable crops (furrow/sprinkler/drip irrigation) **(2 practicals**)
8. Preparation of vegetables for marketing (cleaning, trimming, washing, sorting, grading , stocking and bundling) **(2 practicals**)
9. Preparation of seed herbaria of vegetable crops **(1 practical**)
10. Visit to commercial vegetable garden and local vegetable market is compulsory. *Students should submit visit report in detail during continuous assessment. The report shall carry marks*

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SUBJECT: HORTICULTURE

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CCHP-II: PRACTICALS BASED ON SECTION-A OF CCH-III&IV

(Practical Paper-X)

END OF SEMESTER EXAMINATION (ESE)

Skeleton question paper

Time: Four hours **Maximum Marks: 40**

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 vegetable specimen- **A** and **B**.	**08**
Q2.	Observe and interpret the effect of pre sowing seed treatments on germination of given vegetable specimen-**C.**	**08**
Q3.	Prepare a paper sketch and describeDrip / furrow / sprinkler irrigation system in a vegetable garden	**06**
Q4.	Prepare the given vegetable specimen- **D** for marketing	**06**
Q5.	Identify and describe given spots **E, F, G** and **H** (Root/stem/leaf/flower/fruit vegetable)	**06**
Q6.	Viva voce	**06**

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CLASS: B. Sc. SECOND YEAR

ANNUAL PATTERN

CCHP-III: PRACTICALS BASED ON SECTION-B OF CCH-III&IV

(Practical Paper-XI)

Practicals: 16 **Credits: 02 (Maximum Marks: 50)**

Practical Exercises:

1. Identification of ornamental plants **(2 practicals)**
2. Preparation of nursery beds for raising the seedlings of ornamental plants**(1 practical)**
3. Planting of hedges **(1 practical)**
4. Planting of edges **(1 practical)**
5. Planting and maintenance of lawn **(1 practical)**
6. Study of pruning and training of ornamental crops **(1 practical)**
7. Study of special horticultural practices (pinching/stopping, disbudding, disshooting) **(2 practicals)**
8. Landscaping for highways **(1 practical)**
9. Layout of formal gardens **(1 practical)**
10. Layout of informal gardens **(1 practical)**
11. Study of topiary in gardens **(1 practical)**
12. Study of flower arrangements **(1 practical)**
13. Preparation of media for extending vase life of flowers **(1 practical)**
14. Study of preparation of seed samples of ornamental crops **(1 practical)**
15. Visit to commercial local flower nursery and market is compulsory. *Students should submit visit report in detail during continuous assessment. The report shall carry marks*

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CCHP-III: PRACTICALS BASED ON SECTION-B OF CCH-III&IV

(Practical Paper-XI)

END OF SEMESTER EXAMINATION (ESE)

Skeleton question paper

Time: Four hours **Maximum Marks: 40**

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 ornamental plant specimen **A** and **B**.	**08**
Q2.	Prepare a layout plan of formal / informal garden	**08**
Q3.	Prepare garland / bouquet / flowerpots	**06**
Q4.	Prepare a medium for extending vase life of cut flowers	**06**
Q5.	Identify and describe given spots **C, D, E** and **F** (Ornamental plant samples)	**06**
Q6.	Viva voce	**06**

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SKILL ENHANCEMENT COURSE HORTICULTURE

SECH-I

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

SECH-IA: GREEN HOUSE (PROTECTED CULTIVATION OF PLANTS-PLASTICULTURE)

UNIT-I: PLASTICULTURE (06 PERIODS)

Introduction, Definitions, Need, Concept and principles, History

UNIT-II: GREEN HOUSE (15 PERIODS)

Types, Structure, Ideal Erection, Advantages and disadvantages and aftercare of green house, General list of crops grown in greenhouse

UNIT-III: PRACTICALS (8 PRACTICALS)

Study of green house by visiting green houses of different crops in nearby area. Students are expected to observe and study the green house under different heads such as Name of farmer, site, address, orientation, type, structural design, span-single/multi span, total area, length, width, middle height, side height, foundation depth, framework, covering, cold storage chain-exhaust fan/ fan for circulation of air cooler etc, water management-drip/sprinkler irrigation system/liquid manuring/ foggers etc, equipment-pH meter/water meter etc, electric work, Installation-month and year, building structure- land development/ bore well etc, other miscellaneous work, erection cost (total budget)/ loan facility/subsidy etc, crop grown, yield (average), operation-manual/semi automatic/automatic, transport facility, market, any other, day and date of visit, name of teacher accompanied, Fully/partially controlled, photographs of the visited green house. Students are also expected to prepare a model of green house and a visit report

OR

SECH-IB: ORCHARD LAYOUT AND PLANTING SKILL

UNIT-I: ORHARD (6 PERIODS)

Introduction, Importance of fruit growing, soil, climate, water, manure and fertilizer requirement of fruit crops

UNIT-II: PLANNING AND PLANTING (15 PERIODS)

Planning of an orchard: selection of site, preliminary operations, orchard buildings, roads, paths, well digging, fencing, wind-breaks, selection of plant material, spacing of planting and overall aspects of orcharding. **Planting:** Systems of planting in an orchard (Square system, Rectangular system, Hexagonal system, Quincunx system, Contour system, high density planting system and meadow orcharding)

UNIT-III: PRACTICALS ON LAYOUT OF AN ORCHARD (8 PRACTICALS)

Layout of Square system, Rectangular system, Hexagonal system, Quincunx system, Contour system, digging pits, calculation of number of plants in different systems of planting. Visit to orchards in nearby area. Students are expected to prepare a paper sketch layout plan of planting systems, a visit report and to submit the same at the time of practical examination.

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SKILL ENHANCEMENT COURSE HORTICULTURE

SECH-II

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

SECH-IIA: NURSERY ESTABLISHMENT SKILL

UNIT-I: NURSERY (6 PERIODS)

Introduction, Definition, Importance and Scope of nursery, Factors affecting the nursery establishment, Registration and Certification of nursery

UNIT-II: NURSERY ESTABLISHMENT (15 PERIODS)

Classification of nursery, Time of nursery raising, land requirement, selection of site for a nursery, types of nursery beds, Preparation of nursery beds, Media for raising nursery plants, Propagation structures, Seed and Sowing, Essential operations in nursery raising, aftercare and handling of nursery plants, Management of water, nutrition, weed, temperature, insect pest and diseases in nursery, Parts of nursery, Calculation for seed requirement

UNIT-III: PRACTICALS ON NURSERY ESTABLISHMENT (8 PRACTICALS)

Establishment of a fruit and vegetable nursery. Visit to fruit and vegetable nurseries in nearby area. Students are expected to prepare a model of fruit and vegetable nursery, a visit report and to submit the same at the time of practical examination.

OR

SECH-IIB: FRUIT AND VEGETABLE PRESERVATION SKILL

UNIT-I: PRESERVATION (6 periods)

Introduction, Principle of preservation, Methods of preservation

UNIT-II: PREPARATION AND PRESERVATION OF FRUIT AND VEGETABLE PRODUCTS (15 periods)

Preparation and preservation of Jam, Jelly, Marmalade, Jam Marmalade, Jelly Marmalade, Squash, candy, Sauce and Ketchup, Pickle, Canning of fruits and vegetables

UNIT-III: PRACTICALS ON SPIRULINA CULTIVATION (8 practicals)

Preparation and preservation of Jam, Jelly, Marmalade, Jam Marmalade, Jelly Marmalade, Squash, candy, Sauce and Ketchup, Pickle, Canning of fruits and vegetables. Visit to a fruit and vegetable production industry in nearby area. Students are expected to prepare a model of production industry, a visit report and to submit the same at the time of practical examination.

SUGGESTED READINGS FOR SECB-I&II:

Jitendra Singh (2008): Basic Horticulture, Kalyani Publishers, Ansari Road, 23, Daryaganj, New Delhi, Page1-351

Sharma R.R. and Manish Shrivastav (2004): Internatinal Book Distributing Co. Charbagh, Lucknow, Page 1-488

Arupratan Ghosh (2009): Green house Technology, Kalyani Publishers, Ansari Road, 23, Daryaganj, New Delhi, Page1-223

Vijaya Khader (1993): Mushrooms for livelihood, Kalyani publishers, Ludhiana-141 008, Page 1-64

Patil B.A. et al (2004): Applied Botany, Sunny publication, Pune, Page 1-214

Dhumal K.N. et al (1998): Plant Diversity& Plants and Human welfare, Nirali prakashan, Pune Page 1-296

Aneja K.R. (1993): Experiments in Microbiology, Plant pathology, Tissue culture and Mushroom cultivation, Vishawa prakashan

Aneja K.R. (1993): Experiments in Microbiology, Plant pathology, Tissue culture and Mushroom cultivation, Vishawa prakashan

Kunte Y.N. and K.S. Yawalkar (1988): Introduction to principlesof fruit growing, Agri Horticultural Publishing House, 52, Bajaj Nagar, Nagpur, Page 1-163

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SECH-I&II

END OF SEMESTER EXAMINATION (ESE)

Maximum Marks: 25

SEAT NO:

MARK SHEET

Sr. No.	END OF SEMESTER EXAMINATION (ESE)	Maximum Marks	Obtained Marks
1	Skill Work report submission	10	
2	Over all skill judgement	10	
3	Skill Work presentation	05	
4	Total Marks	25	

Name & Signature of:

Examiner- 1:

Examiner- 2:

REFERENCES:

SR. NO	AUTHOR	TITLE OF BOOK	PUBLICATION
1.	George Acquaah	Horticulture Principles and Principles (IVth)	Prentice Hall, 4 Edition, USA
2.	Carroll Shry, Edward Relley	Introductory Horticulture	Delmark, Cengage Learning, USA
3.	Dhyan Singh, P.K.Chhonkar and B.S. Dwivedi	Manual on Soil, Plant and Water Analysis	Westville Publishing House, New Delhi
4.	Laura Williams Rice, Robert P. Rice Jr.	Practical Horticulture (7th Edition) (Pearson AG)	Prentice Hall, 7th Edition, USA
5.	Chrals Adams, Katherine Bamford, MK Early	Principles of Horticulture	Routledge, 6th Edition, USA
6.	Agrawal, P.K. (1993)	Hand Book of Seed Technology	New Delhi, Delhi: Dept. of Agriculture and Cooperation, National Seed Corporation Ltd.
7.	Bose T.K., Mukherjee, D. (1972)	Gardening in India	New Delhi, Delhi: Oxford & IBH Publishing Co.
8.	Jules, J. (1979)	Horticultural Science, 3rd edition	San Francisco, California: W.H. Freeman and Co.
9.	Kumar, N. (1997)	Introduction to Horticulture	New Delhi, Delhi: McGraw Hill Book Co.
10.	Sandhu, M.K. (1989)	Plant Propagation	Madras, Bangalore: Wile Eastern Ltd.

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