परिपत्रक-UG (1) ST

॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, या विद्यापीठा अंतर्गत येणा–या सर्व संलग्नित महाविद्यालयामध्ये शैक्षणिक वर्ष २०२४–२५ पासून पदवीस्तरावर राष्ट्रीय शैक्षणिक धोरण –२०२० लागू करण्याच्या दृष्टीकोनातून विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत येणा–या अभ्यासमंडळांनी तयार केलेल्या पदवी प्रथम वर्षाचे अभ्यासक्रमांना मा. विद्यापरिषदेने दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या बैठकीतील विषय क्रमांक १५/५९–२०२४ च्या ठरावाअन्वये मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील खालील बी. एस्सी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) लागू करण्यात येत आहेत.

1) B. Sc. I year - Botany
2) B. Sc. I year - Seed Technology
3) B. Sc. I year - Horticulture
4) B. Sc. I year - Geology
5) B. Sc. I year - Dairy Science
6) B. Sc. I year -Electronics
7) B. Sc. I year - Environmental Science
8) B. Sc. I year - Fishery Science
9) B. Sc. I year - Mathematics
10) B. Sc. I year - Microbiology
11) B. Sc. I year - Agricultural Microbiology
12) B. Sc. I year - Physics
13) B. Sc. I year - Food Science
14) B. Sc. I year – Computer Science (N M D College Hingoli)

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

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२४–२५/१९१
दिनांक १२.०६.२०२४

डॉ. सरिता लोसरवार
सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत : १) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
३) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) मा. संचालक, सर्व संकुले परिसर व उपपरिसर, प्रस्तुत विद्यापीठ
५) मा. प्राचार्य, न्यू मॉडल डिग्री कॉलेज हिंगोली.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदर परिपत्रक संकेतस्थळावर प्रसिध्द करण्यात यावे.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED - 431 606 (MS)

(Credit Framework and Structure of Four Year UG Program with Multiple Entry and Exit Option as per NEP-2020)

UNDERGRADUATE PROGRAMME OF SCIENCE & TECHNOLOGY

Major in **Horticulture** and Minor in **DSM** (Subject)

Under the Faculty of Science & Technology

(Revised as per the Govt. Of Maharashtra circular dt. 13th March 2024)

From the Desk of the Dean, Faculty of Science and Technology

Swami Ramanand Teerth Marathwada University, Nanded, enduring to its vision statement "***Enlightened Student: A Source of Immense Power***", is trying hard consistently to enrich the quality of science education in its jurisdiction by implementing several quality initiatives. Revision and updating curriculum to meet the standard of the courses at national and international level, implementing innovative methods of teaching-learning, improvisation in the examination and evaluation processes are some of the important measures that enabled the University to achieve ***the 3Es, the equity, the efficiency*** and ***the excellence*** in higher education of this region. To overcome the difficulty of comparing the performances of the graduating students and also to provide mobility to them to join other institutions the University has adopted the cumulative grade point average (CGPA) system in the year 2014-2015. Further, following the suggestions by the UGC and looking at the better employability, entrepreneurship possibilities and to enhance the latent skills of the stakeholders the University has adopted the Choice Based Credit System (CBCS) in the year 2018-2019 at graduate and post-graduate level. This provided flexibility to the students to choose courses of their own interests. To encourage the students to opt the world-class courses offered on the online platforms like, NPTEL, SWAYM, and other MOOCS platforms the University has implemented the credit transfer policy approved by its Academic Council and also has made a provision of reimbursing registration fees of the successful students completing such courses.

SRTM University has been producing a good number of high calibre graduates; however, it is necessary to ensure that our aspiring students are able to pursue the right education. Like the engineering students, the youngsters pursuing science education need to be equipped and trained as per the requirements of the R&D institutes and industries. This would become possible only when the students undergo studies with an updated and evolving curriculum to match global scenario.

Higher education is a dynamic process and in the present era the stakeholders need to be educated and trained in view of the self-employment and self-sustaining skills like start-ups. Revision of the curriculum alone is not the measure for bringing reforms in the higher education, but invite several other initiatives. Establishing industry-institute linkages and initiating internship, on job training for the graduates in reputed industries are some of the important steps that the University would like to take in the coming time. As a result, revision of the curriculum was the need of the hour and such an opportunity was provided by the New Education Policy 2020. National

Education Policy 2020 (NEP 2020) aims at equipping students with knowledge, skills, values, leadership qualities and initiates them for lifelong learning. As a result the students will acquire expertise in specialized areas of interest, kindle their intellectual curiosity and scientific temper, and create imaginative individuals.

The curriculum given in this document has been developed following the guidelines of NEP-2020 and is crucial as well as challenging due to the reason that it is a transition from general science based to the discipline-specific-based curriculum. All the recommendations of the ***Sukanu Samiti*** given in the **NEP Curriculum Framework-2023** have been followed, keeping the disciplinary approach with rigor and depth, appropriate to the comprehension level of learners. All the Board of Studies (BoS) under the Faculty of Science and Technology of this university have put in their tremendous efforts in making this curriculum of international standard. They have taken care of maintaining logical sequencing of the subject matter with proper placement of concepts with their linkages for better understanding of the students. We take this opportunity to congratulate the Chairman(s) and all the members of various Boards of Studies for their immense contributions in preparing the revised curriculum for the benefits of the stakeholders in line with the guidelines of the **Government of Maharashtra regarding NEP-2020**. We also acknowledge the suggestions and contributions of the academic and industry experts of various disciplines.

We are sure that the adoption of the revised curriculum will be advantageous for the students to enhance their skills and employability. Introduction of the mandatory ***On Job Training, Internship program*** for science background students is praise worthy and certainly help the students to imbibe firsthand work experience, team work management. These initiatives will also help the students to inculcate the workmanship spirit and explore the possibilities of setting up of their own enterprises.

Dr. M. K. Patil
Dean
Faculty of Science and Technology

From Desk of Chairman, Board of Studies of the Subject Horticulture

PREAMBLE

The B.Sc. Horticulture semester pattern course is running in different affiliated colleges of the S.R.T.M.U. Nanded. The program is designed to encourage and support the growing demands and challenging trends in the academic environment. Our training focuses on holistic development of students to face the competitive world. The course content has been designed on NEP-2020 pattern. The program consists of Major (C), Minor (M), Generic Electives (GE), Vocational and Skill Enhancement Course (VSEC). The course content of each theory paper is divided into four units by giving appropriate titles and subtitles. For each unit, total number of periods required, weightage of maximum marks and credits are mentioned. A list of practical exercises for laboratory course work based on theory papers to be completed in the academic year is also given. A list of selected reading material and a common skeleton question paper for all the theory papers of semester-I &II are also provided at the end of the syllabus.

The programme also inculcates various attributes at the Honours level. These attributes encompass values related to emotional stability, social justice, creative and critical thinking, well-being and various skills required for employability, thus preparing students for continuous learning and sustainability. The new curriculum based on learning outcomes of BSc (Honours) Horticulture offers knowledge of areas including Plant Pathology, Soil Science, Meterology, Plant Physiology, Plant Biotechnology, Botany, Genetics and Plant breeding, Agricultural Economics, Statistics, Food Preservation and value addition, Ecology, Conservation biology, Bioinformatics, Medicinal and Aromatic plants, etc. The courses define clearly the objectives and the learning outcomes, enabling students to choose the elective subjects broadening their skills in the field of Horticulture. The course also offers skills to pursue research and teaching in the field of Horticulture and thus would produce best minds to meet the demands of society This curriculum framework for the bachelor-level program in Horticulture is developed keeping in view of the student-centric learning pedagogy, which is entirely outcome-oriented and curiosity-driven. To avoid a role-learning approach and foster imagination, the curriculum is more leaned towards self-discovery of concepts. The curriculum framework focuses on the pragmatist approach whereby practical application of theoretical concepts is taught with substantial coverage of practical and field works. The addition of Generic Electives, Vocational and Skill Enhancement Courses aims to develop skills in plant sciences and practical experience in the students.

OBJECTIVES OF THE B. Sc. BOTANY PROGRAMME:

The Objective of this program are :

1. Understand the scope and importance of discipline.
2. Install a love and curiosity for nature through living plants.
3. To make students open-minded and curious, we try our best to nurture and develop scientific Attitude.
4. We make students fit for society by enabling them to work hard.
5. Make the students exposed to the diverse life forms.
6. Make them skilled in practical work, experiments, laboratory equipment and to interpret correctly on biological materials and data.
7. Develop interest in Biological research.
8. Encourage students to research related topics.
9. Develop a thirst for protecting natural resources and the environment.
10. Develop the ability to use the knowledge acquired in various spheres of life to make our country self-reliant
11. Appreciate and apply ethical principles to biological science research and practice.

PROGRAM SPECIFIC OUTCOMES (PSO) OF B.Sc. HORTICULTURE:

By the end of the program the students will be able to:

PO1: Skill development for the proper description using botanical and horticultural terms, identification, naming and classification of life forms especially plants and microbes.

PO2: Acquisition of knowledge on structure, life cycle and life processes that exist among plant, insect and microbial diversity through certain model organism studies.

PO3: Understanding of various interactions that exist among plants, insects and microbes; to develop the curiosity on the dynamicity of nature.

PO4: Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study.

PO5: Ability to explain the diversity and evolution based on the empirical evidences in morphology, anatomy, plant propagation, plant physiology, genetics and plant breeding, biotechnology, agricultural economics, food preservation and post harvest technology, biochemistry, molecular biology and life history.

PO6: Skill development for the collection, preservation and recording of information after observation and analysis- from simple illustration to molecular database development.

PO7: Making aware of the scientific and technological advancements- Information and

Communication, Biotechnology and Molecular Biology for further learning and research in all branches of Horticulture.

PO8: Internalization of the concept of conservation and evolution through the channel of spirit of inquiry.

PO9: To enable the graduates to prepare for national as well as international level competitive examinations like UGC-CSIR, UPSC etc.

PO10: To enable the students for practicing the best teaching pedagogy as a biology teacher including the latest digital modules.

PO11: The graduates should be knowledgeable and competent enough to appropriately deliver on aspects of global importance like climate change, SDGs, green technologies etc at the right opportunity.

PO12: The graduate should be able to demonstrate sufficient proficiency in the hands-on experimental techniques for their area of specialization within biology during research and in the professional career.

PO13: The program enables the students to face NET, SET, MPSC, UPSC and other competitive examinations successfully.

Dr. Parshuram Vitthalrao Pawar

Chairman,

Board of Studies in Horticulture

Swami Ramanand Teerth Marathwada University,

Nanded

Details of the Board of Studies Members in the subject Horticulture under the faculty of Science & Technology of S.R.T.M. University, Nanded

Sr No	Name of the Member	Designation	Address	Contact No.
1.	Dr. Parshuram Vitthalrao Pawar	Chairman	Madhavrao Patil, ACS College, Palam Dist. Parbhani.	9049086295
2	Dr. Sonalkumar Shamsundar Nagarkar	Member	Adarsh College, Hingoli, Tq. & Dist. Hingoli.	9657572981
3	Dr. Shankar Gopinath Yadav	Member	Shivaji Mahavidyalaya, Renapur, Dist. Latur.	9421413520
4	Dr. Shyam Laxmanrao Ingle	Member	H.J.P. college, Himayat nagar, Dist. Nanded.	9881456859
5	Dr. Shivaji Piraji Rakhonde	Member	Sant Tukaram College of Arts and Science, Parbhani	9850175189
6	Dr. Sachin Arvindrao Patil	Invitee Member	Yeshwant Mahavidyalaya, Nanded	9356596159

B. Sc. First Year Semester I *(Level 4.5)*

Teaching Scheme

	Course Code	CourseName	CreditsAssigned			TeachingScheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	SHORCT1101	**Fundamentals of Horticulture**	02	--	**04**	02	--
	SHORCP1101	**Practical Based on SHORCT 1101**	-	02			04
Optional 2	SBOTMT1101	**Optional 2**	02	--	**04**	02	--
	SBOTMP1101	**Optional 2**	-	02			04
Optional 3	SCHEMT1101	**Optional 3**	02	--	**04**	02	--
	SCHEMP1101	**Optional 3**	-	02			04
Generic Electives *(from other Faculty)*	SHORGE1101	**Basic Horticulture (Basket 3)**	02	--	**02**	02	--
Skill Based Course (related to Major)	SHORSC1101	Orchard Layout Planting Skill	--	02	**02**	--	04
Ability Enhancement Course	AECENG1101	L1 – Compulsory English	02	--	**02**	02	--
Ability Enhancement Course	ACEMIL1101	MAR/HIN/URD/KAN/PAL	02	--	**02**	02	--
Indian Knowledge System (IKS)	IKSXXX1101	Select from **Basket 5**	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B. Sc. First Year Semester I *(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	CourseName (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Continuous Assessment (CA)			ESA			
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Optional 1	SHORCT1101	**Fundamentals of Horticulture**	10	10	10	40	--	--	50
	SHORCP1101	**Practical Based on SHORCT 1101**	--	--	--	--	20	30	50
Optional 2	SBOTMT1101	**Optional 2**	10	10	10	40	--	--	50
	SBOTMP1101	**Optional 2**	--	--	--	--	20	30	50
Optional 3	SCHEMT1101	**Optional 3**	10	10	10	40	--	--	50
	SCHEMP1101	**Optional 3**	--	--	--	--	20	30	50
Generic Elective	SHORGE1101	**Basic Horticulture (Basket 3)**	10	10	10	40	--	--	50
Skill Based Course	SHORSC1101	Orchard Layout Planting Skill	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1101	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	ACEMIL1101	MAR/HIN/URD/KAN/PAL	10	10	10	40	--	--	50
Indian Knowledge System (IKS)	IKSXXX1101	Select from **Basket 5**	10	10	10	40	--	--	50

B. Sc. First Year Semester II *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	SHORCT1151	Production Technology of Tropical and Sub-tropical Fruit Crops	02	--	**04**	02	--
	SHORCP1151	**Practical Based on SHORCT 1151**	-	02			04
Optional 2	SBOTMT1151	**Optional 2**	02	--	**04**	02	--
	SBOTMP1151	**Optional 2**	-	02			04
Optional 3	SCHEMT1151	**Optional 3**	02	--	**04**	02	--
	SCHEMP1151	**Optional 3**	-	02			04
Generic Electives *(from other Faculty)*	SHORGE1151	Production Technology of Fruit Crops Basket 3	02	--	**02**	02	--
Skill Based Course (related to Major)	SHORSC1151	Layout of Irrigation Systems	--	02	**02**	--	04
Ability Enhancement Course	AECENG1151	L1 – Compulsory English	02	--	**02**	02	--
Ability Enhancement Course	ACEMIL1151	MAR/HIN/URD/KAN/PAL	02	--	**02**	02	--
Value Education Courses	VECCOI1151	Constitution of India	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B. Sc. First Year Semester II *(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	CourseName (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Continuous Assessment(CA)			ESA			
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Optional 1	SHORCT1151	Production Technology of Tropical and Sub-tropical Fruit Crops	10	10	10	40	--	--	50
	SHORCP1151	**Practical Based on SHORCT 1151**	--	--	--	--	20	30	50
Optional 2	SBOTMT1151	**Optional 2**	10	10	10	40	--	--	50
	SBOTMP1151	**Optional 2**	--	--	--	--	20	30	50
Optional 3	SCHEMT1151	**Optional 3**	10	10	10	40	--	--	50
	SCHEMP1151	**Optional 3**	--	--	--	--	20	30	50
Generic Elective	SHORGE1151	Production Technology of Fruit Crops Basket 3	10	10	10	40	--	--	50
Skill Based Course	SHORSC1151	Layout of Irrigation Systems	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1151	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	ACEMIL1151	MAR/HIN/URD/KAN/PAL	10	10	10	40	--	--	50
Value Education Courses	VECCOI1151	Constitution of India	10	10	10	40	--	--	50

Syllabus for B. Sc. Botany, First Year

Semester – I

As Per National Education Policy- 2020

To be Implemented from

Academic Year 2024-2025

National Education Policy 2020

B.Sc. Horticulture, I Year (Semester - I)

Major Core Theory Course

Course Code – SHORCT1101

Title of the Course: FUNDAMENTALS OF HORTICULTURE

[No. of Credits: 2 Credit] **[Total: 30 Hours]**

SHORCC 1101: Fundamentals of Horticulture

Course pre-requisite:

1. The course is offered for a student registered for undergraduate programme in the Faculty of Science and Technology who had primary training in the field of biology at higher secondary school level evident in terms of certificate by CBSC/ ICSC/HSC for entry level core courses in Horticulture as Major subject.
2. The students should have basic knowledge of plant science.

Course objectives:

1. To study and impart knowledge about the occurrence, distribution, structure and life history of Fundamentals of Horticulture.
2. To instil in students an appreciation for the diversity of life forms and structural organization that exists within plant bodies that allow plants to develop and live as integrated organisms in diverse environments.

Course outcomes:

1. The students understand the Fundamentals of Horticulture.
2. The students are able to differentiate between various branches of Horticulture viz. Pomology, Olericulture and Floriculture.
3. The students learn the importance of Fruit cultivation and its management practices.

CURRICULUM DETAILS: SHORCT 1101: FUNDAMENTALS OF HORTICULTURE

oduleNo.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to Horticulture**	**07**
	1.1	**1.** Definition, branches, scope and economic importance of horticultural crops	
	1.2	**2.** Nutritive value of fruits and vegetables	
	1.3	**3.** Classification of horticultural crops based on: a. Climatic requirements b. Season of growth c. Plant parts used for consumption d. Botanical classification	
	1.4	**4.** Horticultural zones of India and Maharashtra	
2.0		**Principles of Horticulture**	**08**
	2.1	Soil and climatic requirements of horticultural crops, Selection of site for establishment of orchard, Planning, layout and planting of orchard	
	2.2	Bearing habit, fruit bud differentiation and flower and fruit drop	

	2.3	Training and pruning,Fruitfulness and unfruitfulness	
	2.4	Cropping system	
3.0		**Management Horticulture**	
	3.1	Orchard management	**07**
	3.2	Nutrition management	
	3.3	Water management and Weed management	
	3.4	Plant protection	
4.0		**Applied Horticulture**	
	4.1	Mechanism of action and biological effect of following plant growth regulators: a. Auxins b. Gibberellins c. Cytokinins d. Ethylene	
	4.2	**Special horticultural practices in:** **Fruit crops:** a. Bahar treatment b. Girdling c. Notching d. Ringing e. Bending	**08**
	4.3	**Special horticultural practices in:** **Vegetable crops:** a. Earthing up b. Staking c. Blanching	
	4.4	**Special horticultural practices in:** **Flower crops:** a. Pinching b. Disbudding c. Deshooting	
		Total	**30**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi
2. S. N. Gupta (2023). Instatnt Horticulture, Jain brothers Publication, Bhopal, (MP)
3. Singh, Yumanm Somi (2017) A textbook of Horticulture, Biotech Publishers, Delhi.
4. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.
5. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

National Education Policy 2020

B.Sc. Horticulture, I Year (Semester - I)

Major Practical Course

Course Code – SHORCP 1101

Title of the Course: Practical based on SHORCT 1101

[No. of Credits: 2 Credit] **[Total: 60 Hours]**

Course pre-requisite:

1. The course is offered for a student registered for undergraduate programme in the Faculty of Science and Technology who had primary training in the field of biology at higher secondary school level evident in terms of certificate by CBSC/ ICSC/HSC for entry level core courses in Horticulture as Major subject.
2. The students should have basic knowledge of plant science.

Course objectives:

1. To develop skill and technique among the students for handling microscope, Chemicals and glasswares different instruments in the Horticulture lab.
2. To study and impart knowledge about basic horticultural principles, sexual and asexual propagation techniques of plants.
3. To understand the nursery management practices.

Course outcomes:

1. Students develop skill and technique for handling microscope Chemicals and glasswares and different instruments in the Horticulture lab.
2. The students understand the importance of fruits, vegetables and flowers in day and day life, the importance of basic horticulture.
3. The students learn the techniques of grafting, budding and nursery requisites of young plantlets.

CURRICULUM DETAILS: SHORCP 1101: Practical based on SHORCT 1101

Sr. No	Practical Exercises	Hrs. Required to cover the contents
1.	Introduction to fruit crops	4
2.	Study of garden tools and implements	4
3.	Study of different media, containers and potting and repotting	4
4.	Preparation of nursery beds and raising of nursery seedlings	4
5.	Layout of square and rectangle system of planting	4
6.	Study of different methods of cutting	4
7.	Study of different methods of layering	4

8.	Study of different methods of budding	4
9.	Study of different methods of grafting	4
10.	Study of different methods of training and pruning	4
11.	Study of manures and fertilizer application methods followed in horticultural crops	4
12.	Study of irrigation methods followed in horticultural crops	4
13.	Study of special horticultural practices followed in fruit crops	4
14.	Identification and collection of important pests and diseases in fruit crops	4
15.	Visit to a nursery unit	4
	Total	**60**

Text Books and Reference Books:

1. Arun kumar, Abhinav kumar (2023) Plant Propagation and Nursery Management, S. K. Kataria and Sons, New Delhi.
2. Sharma R. R. (2022) Propagation of Horticultural Crops, Kalyani Publications, New Delhi.
3. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi
4. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.
5. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi
6. S. N. Gupta (2023). Instatnt Horticulture, Jain brothers Publication, Bhopal, (MP)
7. Singh, Yumanm Somi (2017) A textbook of Horticulture, Biotech Publishers, Delhi.

National Education Policy 2020

B.Sc. Horticulture, I Year (Semester - I)

Generic Elective Course

Course Code – SHORGE 1101

Title of the Course: BASIC HORTICULTURE

[No. of Credits: 2 Credit] **[Total: 30 Hours]**

Coursepre-requisite:

1. Passed HSC or equivalent exam.
2. Should have basic knowledge of plant science.

Courseobjectives:

1. To study and impart knowledge about the fundamentals of horticulture
2. To study and impart knowledge about principles, management and applied horticulture

Courseoutcomes:

1. Students would be able to understand fundamental knowledge of horticulture
2. Student would be able to understand the principles, management and applied horticulture

CURRICULUM DETAILS: SHORGE 1101: BASIC HORTICULTURE

ModuleNo.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to Horticulture**	**07**
	1.1	**1.** Definition, branches, scope and economic importance of horticultural crops	
	1.2	**2.** Role of horticultural crops in human nutrition	
	1.3	**3.** Classification of horticultural crops based on: a. Climatic requirements b. Season of growth c. Plant parts used for consumption d. Botanical classification	
	1.4	**4.** Horticultural zones of India and Maharashtra	
2.0		**Basic of Horticulture**	**08**
	2.1	Soil and climatic requirements of horticultural crops, Selection of site for establishment of orchard, Planning.	
	2.2	layout and planting of orchard	
	2.3	layout and planting of orchard	

	2.4	Cropping system	
3.0		**Management Horticulture**	**07**
	3.1	Nutrition management	
	3.2	Water management and Weed management	
	3.3	Plant protection	
4.0		**Applied Horticulture**	**08**
	4.1	Mechanism of action and biological effect of following plant growth regulators: a. Auxins b. Gibberellins c. Cytokinins d. Ethylene	
	4.2	**Special horticultural practices in:** **Fruit crops:** a. Bahar treatment b. Girdling c. Notching d. Ringing e. Bending	
	4.3	**Special horticultural practices in:** **Vegetable crops:** a. Earthing up b. Staking c. Blanching	
	4.4	**Special horticultural practices in:** **Flower crops:** a. Pinching b. Disbudding c. Deshooting	
		Total	**30**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi
2. S. N. Gupta (2023). Instatnt Horticulture, Jain brothers Publication, Bhopal, (MP)
3. Singh, Yumanm Somi (2017) A textbook of Horticulture, Biotech Publishers, Delhi.
4. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.
5. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

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B.Sc. Horticulture, I Year (Semester - I)

Skill Enhancement Course

Course Code – SHORSC1101

Title of the Course: *ORCHARD LAYOUT PLANTING SKILL*

[No. of Credits: 2 Credit] **[Total: 60 Hours]**

Course pre-requisite:

1. The course is offered for a student registered for undergraduate programme in the Faculty of Science and Technology who had primary training in the field of biology at higher secondary school level evident in terms of certificate by CBSC/ ICSC/HSC for entry level core courses in Horticulture as Major subject.
2. The students should have basic knowledge of plant science.

Course objectives:

1. To inculcate concepts of Orchards.
2. To understand techniques in Orchard management and layout.
3. To increase employability of the students.
4. To improve the productivity of crops.

Course outcomes:

1. Understanding the role of Orchard cultural practices.
2. Understanding the potential of Layout and planting.
3. Role of Management of orchard to increase the productivity of crops.

CURRICULUM DETAILS: SHORSC 1101: *ORCHARD LAYOUT PLANTING SKILL*

Sr. No	Practical Exercises	Hrs. Required to cover the contents
1.	Introduction, Importance of fruit growing,	4
2.	Soil requirement of fruit crops	
3.	Climate requirement of fruit crops	4
4.	Water requirement of fruit crops	4
5.	Manure and fertilizer requirement of fruit crops	4
6.	selection of site,	4
7.	preliminary operations, orchard buildings, roads, paths, well digging, fencing, windbreaks,	4
8.	Selection of plant material, spacing of planting and overall aspects of orchard.	4
9.	Necessity of Systems of planting in an orchard	4

10.	Square system of Planting.	4
11.	Rectangular system of Planting	4
12.	Quincunx system of Planting	4
13.	Contour system of Planting	4
14.	High density planting system	4
15.	Visit to an orchard	4
	Total	**60**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi
2. S. N. Gupta (2023). Instatnt Horticulture, Jain brothers Publication, Bhopal, (MP)
3. Singh, Yumanm Somi (2017) A textbook of Horticulture, Biotech Publishers, Delhi.
4. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.
5. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

Syllabus for B. Sc. Horticulture, First Year

Semester – II

As Per National Education Policy- 2020

To be Implemented from

Academic Year 2024-2025

National Education Policy 2020

B.Sc. Horticulture, I Year (Semester - II)

Major Core Theory Course

Course Code – SHORCT 1151

Title of the Course: Production Technology of Tropical and Sub-tropical Fruit Crops

[No. of Credits: 2 Credit] **[Total: 30 Hours]**

Coursepre-requisite:

1. Passed HSC or equivalent exam.
2. Should have basic knowledge of plant science.

Courseobjectives:

1. To study and impart knowledge about the cultivation of tropical and subtropical fruit crops
2. To study and impart knowledge about fruit physiology

Course outcomes:

1. Students would be able to understand fundamental knowledge of cultivation of tropical and subtropical fruit crops
2. Student would be able to understand fruit physiology

CURRICULUM DETAILS: SHORCT 1151: PRODUCTION TECHNOLOGY OF TROPICAL AND SUB-TROPICAL FRUIT CROPS

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to tropical and sub-tropical fruit crops**	**07**
	1.1	. Importance of fruit growing in India and Maharashtra	
	1.2	Nutritive value of fruits	
	1.3	Area and production of India and Maharashtra	
	1.4	Exports and imports of fruits in India	
	1.5	Constraints in fruit production and remedies to overcome them	
2.0		**Cultivation practices of tropical fruit crops**	**08**
	2.1	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 Banana	
	2.2	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 Guava	

	2.3	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 Papaya	
	2.4	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 Sapota	
3.0		**Cultivation practices of sub-tropical fruit crops**	
	3.1	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 Citrus fruits:a. Kagzi limeb. Sweet orange c. Mandarin	
	3.2	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 Grapes	**07**
	3.3	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 Mango	
		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 Pomegranate	
4.0		**Major physiological disorders of following fruit crops**	
	4.1	Mango: a. Alternate bearing and Spongy tissue	
	4.2	Citrus Granulation and Gummosis	**08**
	4.3	Bareness in grapes	
		Fruit cracking in pomegranate	
		Total	**30**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi

2. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.

3. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

4. T. K. Chattopadhyay (2022), A textbook on Pomology, Kalyani Publications, New Delhi

5. J. S. Bal (2018) Fruit Science NIPA Genx Electronic, New Delhi.

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B.Sc. Horticulture, I Year (Semester -II)

Major Practical Course

Course Code – SHORCP 1151

Title of the Course: Practical based on SHORCT 1151

[No. of Credits: 2 Credit] **[Total: 60 Hours]**

Coursepre-requisite:

1. Passed HSC or equivalent exam.
2. Should have basic knowledge of plant science.

Courseobjectives:

1. To study and impart knowledge about the cultivation of tropical and subtropical fruit crops
2. To study and impart knowledge about fruit physiology

Course outcomes:

1. Students would be able to understand fundamental knowledge of cultivation of tropical and subtropical fruit crops
2. Student would be able to understand fruit physiology

CURRICULUM DETAILS: SHORCP 1151: Practical based on SHORCT 1151

Sr. No	Practical Exercises	Hrs. Required to cover the contents
1.	Introduction to fruit crops	4
2.	Preparation of nursery beds and raising of nursery seedlings	4
3.	Layout of system of planting in Orchards	4
4.	Layout of Contour system of planting	4
5.	Study of Propagation in Horticultural Crops	4
6.	Study of different methods of training	4
7.	Study of different methods of pruning	4
8.	Study of application of plant growth regulators in horticultural crops	4
9.	Study of manures and fertilizer application methods followed in horticultural crops	4
10.	Study of irrigation methods followed in horticultural crops	4
11.	Study of Crop Regulation in Orchards	4
12.	Study of special horticultural practices followed in fruit crops	4

13.	Identification and collection of important pests and diseases in fruit crops	4
14.	Visit to commercial orchards	4
15.	Visit to fruit market	4
	Total	**60**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi

2. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.

3. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

4. T. K. Chattopadhyay (2022), A textbook on Pomology, Kalyani Publications, New Delhi

5. J. S. Bal (2018) Fruit Science NIPA Genx Electronic, New Delhi.

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B.Sc. Horticulture, I Year (Semester - II)

Generic Elective Course

Course Code – SHORGE 1151

Title of the Course: PRODUCTION TECHNOLOGY OF FRUIT CROPS

[No. of Credits: 2 Credit] **[Total: 30 Hours]**

Coursepre-requisite:

1. Passed HSC or equivalent exam.
2. Should have basic knowledge of plant science.

Courseobjectives:

1. To study and impart knowledge about the cultivation of tropical and subtropical fruit crops
2. To study and impart knowledge about fruit physiology

Course outcomes:

1. Students would be able to understand fundamental knowledge of cultivation of tropical and subtropical fruit crops
2. Student would be able to understand fruit physiology

CURRICULUM DETAILS: SHORGE 1151: PRODUCTION TECHNOLOGY OF FRUIT CROPS

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to tropical and sub-tropical fruit crops**	**07**
	1.1	. Importance of fruit growing in India and Maharashtra	
	1.2	Nutritive value of fruits	
	1.3	Area and production of India and Maharashtra	
	1.4	Exports and imports of fruits in India	
	1.5	Constraints in fruit production and remedies to overcome them	
2.0		**Cultivation practices of tropical fruit crops**	**08**
	2.1	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 Banana	
	2.2	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 Guava	

	2.3	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 Papaya	
	2.4	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 Sapota	
3.0		**Cultivation practices of sub-tropical fruit crops**	
	3.1	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 Citrus fruits:a. Kagzi limeb. Sweet orange c. Mandarin	
	3.2	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 Grapes	**07**
	3.3	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 Mango	
		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 Pomegranate	
4.0		**Major physiological disorders of following fruit crops**	
	4.1	Mango: a. Alternate bearing and Spongy tissue	
	4.2	Citrus Granulation and Gummosis	**08**
	4.3	Bareness in grapes	
		Fruit cracking in pomegranate	
		Total	**30**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi

2. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.

3. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

4. T. K. Chattopadhyay (2022), A textbook on Pomology, Kalyani Publications, New Delhi

5. J. S. Bal (2018) Fruit Science NIPA Genx Electronic, New Delhi.

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B.Sc. Horticulture, I Year (Semester - II)

Skill Enhancement Course

Course Code – SHORSC 1151

Title of the Course: LAYOUT OF IRRIGATION SYSTEMS

[No. of Credits: 2 Credit] [Total: 30 Hours]

Course pre-requisite:

1. The course is offered for a student registered for undergraduate programme in the Faculty of Science and Technology who had primary training in the field of biology at higher secondary school level evident in terms of certificate by CBSC/ ICSC/HSC for entry level core courses in Horticulture as Major subject.
2. The students should have basic knowledge of plant science.

Course objectives:

1.To inculcate concepts of Irrigation.
2. To understand techniques in irrigation intervals.
3. To increase employability of the students.
4. To improve the productivity of crops.

Course outcomes:

1. Understanding the role of Irrigation systems.
2. Understanding the potential of Layout and planning of irrigation schedule.
3. Role of Management of orchard to increase the productivity of crops.

CURRICULUM DETAILS: SHORSC 1151: LAYOUT OF IRRIGATION SYSTEMS

Sr. No	Practical Exercises	Hrs. Required to cover the contents
1.	Introduction of Irrigation Systems	4
2.	Importance of Irrigation Systems	4
3.	Soil of Irrigation Systems	4
4.	Climate of Irrigation Systems	4
5.	Water requirement of horticultural crops	4
6.	Critical stages of plants	4
7.	Uptake of moisture	4
8.	Roll in photosynthesis, translocation of nutrients	4
9.	Evaporation losses	4

10.	Layout of Ring irrigation system	4
11.	Subsurface irrigation system	4
12.	Drip irrigation system	4
13.	Sprinkler Irrigation system	4
14.	Fertigation	4
15.	Visit to orchards in nearby area	4
	Total	**60**

Text Books and Reference Books:

1. Jitendra Singh (2018). Fundamentals of Horticulture, Kalyani Publications, New Delhi

2. N. Kumar (2021). Introduction to Horticulture, MedTech Science Press, New Delhi.

3. Prashant Bakshi, Kiran Kaur, Amit Jasrotia (2024) Fundamentals of Horticulture – Principles and Practices, Narendra Publication House, Delhi

4. T. K. Chattopadhyay (2022), A textbook on Pomology, Kalyani Publications, New Delhi

5. J. S. Bal (2018) Fruit Science NIPA Genx Electronic, New Delhi.

Guidelines for the Course Assessment:

A. Continuous Assessment (CA) (20% of the Maximum Marks) of theory and practical courses:

i. **For Theory Course:** CA shall form 20% of the Maximum Marks and shall be carried out over the entire semester. It shall be done by conducting **Two Tests** (Test I on 40% curriculum) and **Test II** (on remaining 40% syllabus) and average of the marks scored by a student in these two tests of a particular paper shall be taken as the **CA** score.

ii. **For Practical Course:** CA score of the practical course shall be marks scored by a student in the internal practical examination conducted by the concerned teacher.

B. End Semester Assessment (80% of the Maximum Marks) of theory and practical courses:

(For illustration a paper of 02 credits, 50 marks has been considered and shall be modified appropriately depending upon credits of the individual paper)

Question Paper Pattern of the ESA:

i. **ESA Question paper shall consist 6 questions, each of 10 marks**
ii. **Question No.1 shall be compulsory and shall be based on the entire syllabus**
iii. Students shall have to solve ***ANY THREE*** of the remaining Five Questions (i.e. from question 2 to 6)
iv. **Students shall have to solve a TOTAL of 4 Questions.**

C. Assessment of On Job Training (OJT) Course (for 04 credits):

a. Continuous assessment part (**40%, 40 marks out of 100**) of this course shall be done by the mentor of the student, where he /she is supposed to complete his On Job Training. This shall be based on the regularity, participation and performance of the students at the place of OJT.

b. Semester End Assessment (ESA) (**60% of the total marks, 60 marks out of 100**) of this course shall be done by a panel of examiners in two parts

i. based on the work report submitted by the student (**50% i.e. 30 marks)** and

ii. **Remaining 50%** (30 marks) shall be based on his presentation and viva-voce on the work carried to be assessed by the panel of examiners. This assessment shall be done along with practical examinations of respective courses / subjects.

D. Assessment of Field Project (FP) and Research Project (RP) (e.g. for 02 credits)

a. Continuous assessment part (**40%, 20 marks out of 50**) of this course shall be done by the mentor of the student and shall be based on regularity, experimental work and performance of the student.

b. Semester End Assessment (ESA) (**60% of the total marks, 30 marks out of 50**) of this course shall be done shall be done by a panel of examiners in two parts

i. based on the work report submitted by the student (**50% i.e. 30 marks)** and

ii. **Remaining 50%** (30 marks) shall be based on his presentation and viva-voce on the work carried out by the student. This assessment shall be done along with practical examinations of the respective courses / subjects.

E. Assessment of Co-Curricular courses (CCC):

a. Assessment of the CCC course shall be done by the respective course coordinator as a part of CA and be based on the regularity, performance of a student and his participation in various activities as prescribed in the regulations prepared in this regard.

b. The End Semester Assessment (ESA) of the CCC courses shall be done as per the regulations prepared in this regard and shall be done on the basis of the write-up, presentation by the student on the activities that he has carried out in a semester.

c. Students shall have freedom to opt for more than one CCC courses. However, score of the best performing CC shall be considered for preparing his result.

F. Syllabi, Teaching and Examination Scheme for the courses in Column 7 and Column 8 (AEC, VEC, IKS, CI, EVS, CCCs, etc.) shall be common for all the students from different faculties.

Note: Number of lectures required to cover syllabus of a course depends on the number of credits assigned to a particular course. One credit of theory corresponds to 15 Hours lecturing and for practical course one credit corresponds to 30 Hours. For example, for a course of two credits 30 lectures of one hour duration are assigned, while that for a three credit course45 lectures.

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