

॥ सा विद्या या विमुक्तये ॥



स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

“ज्ञानतीर्थ” परिसर, विष्णुपुरी, 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

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संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील तृतीय वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२१-२२ पासून लागू करण्याबाबत.

परिपत्रक

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, मा. विद्याशाखेने दिनांक ३१ मे २०२१ रोजीच्या बैठकीतील केलेल्या शिफारशीप्रमाणे व दिनांक १२ जून २०२१ रोजी संपन्न झालेल्या ५१ व्या मा. विद्या परिषद बैठकीतील विषय क्र. २६/५१-२०२१च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील तृतीय वर्षाचे खालील विषयांचे C.B.C.S. (Choice Based Credit System) Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२१-२२ पासून लागू करण्यात येत आहेत.

1. B.Sc.-III Year-Biophysics
2. B.Sc.-III Year-Bioinformatics
3. B.Sc.-III Year-Biotechnology
4. B.Sc.-III Year-Biotechnology (Vocational)
5. B.Sc.-III Year-Botany
6. B.Sc.-III Year-Horticulture
7. B.Sc.-III Year-Agro Chemical Fertilizers
8. B.Sc.-III Year-Analytical Chemistry
9. B.Sc.-III Year-Biochemistry
10. B.Sc.-III Year-Chemistry
11. B.Sc.-III Year-Dyes & Drugs Chemistry
12. B.Sc.-III Year-Industrial Chemistry
13. B.C.A. (Bachelor of Computer Application)-III Year
14. B.I.T. (Bachelor of Information Technology)-III Year
15. B.Sc.-III Year-Computer Science
16. B.Sc.-III Year-Network Technology
17. B.Sc.-III Year-Computer Application (Optional)
18. B.Sc.-III Year-Computer Science (Optional)
19. B.Sc.-III Year-Information Technology (Optional)
20. B.Sc.-III Year-Software Engineering
21. B.Sc.-III Year-Dairy Science
22. B.Sc.-III Year-Electronics
23. B.Sc.-III Year-Environmental Science
24. B.Sc.-III Year-Fishery Science
25. B.Sc.-III Year-Geology
26. B. A./B.Sc.-III Year-Mathematics
27. B.Sc.-III Year-Microbiology
28. B.Sc.-III year Agricultural Microbiology
29. B.Sc.-III Year-Physics
30. B. A./B.Sc.-III Year Statistics
31. B.Sc.-III 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, ही विनंती.

‘ज्ञानतीर्थ’ परिसर,

विष्णुपुरी, नांदेड - ४३१ ६०६.

जा.क्र.: शैक्षणिक-१/परिपत्रक/पदवी-सीबीसीएस अभ्यासक्रम/
२०२१-२२/७५

दिनांक : १२.०७.२०२१.

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.
- ४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
- ५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
- ६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.
- ७) अधीक्षक, परीक्षा विभाग विज्ञान व तंत्रज्ञान विद्याशाखा प्रस्तुत विद्यापीठ.

स्वाक्षरित

सहा.कुलसचिव

शैक्षणिक (१-अभ्यासमंडळ) विभाग

Swami Ramanand Teerth Marathwada University,
Nanded



B. O. S. IN CHEMISTRY
B. SC. THIRD YEAR (AGROCHEMICALS AND FERTILIZERS)
SEMESTER- V & VI
CBCS Course
Effective from JUNE – 2021

Swami Ramanand Teerth Marathwada University,
Nanded

Choice Based Credit System (CBCS) Course
Structure

Subject: Agrochemicals and Fertilizers

B. Sc. Third Year (Semester-V & VI)

Semester Pattern effective from June -2021

B.Sc. Third Year Structure Subject : AGROCHEMICALS AND FERTILIZERS

Semester	Course No.	Name of the Course	Instructio ns Hrs/week	Total Period	Internal Evaluation	Marks of Semester	Total Mark s	Credit s
V	DSEAGF I SECTION A	Agronomy and seed technology (PXII)	03	45	10	40	50	02
	DSEAGF I SECTION B / ELECTIVE	Horticulture (P- XIII) OR	03	45	10	40	50	02
		Vegetable Production	03	45	10	40	50	
	DSECAGF P-I (DECAGF I-II)	Practical based on P-XII & P-XIV (P- XVI)	04	Practicals 08 08	05 05	20 20	25 25	01 01
	DSEAGF P-II (DECAGF)	SEC III (1 Skill/Project)			15x3=45			(02)*
	OR DECAGF-P I	Practical based on P-XIII Elective	04	08 Practical	05	20	25	
VI	DSEAGF II SECTION A	Preservation of fruits and vegetables P-XIV	03	45	10	40	50	02
	DSEAGF II SECTION B / ELECTIVE	Agricultural Technology OR	03	45	10	40	50	02
		Hydroponics Technology P-XV	03	45	10	40	50	
	DSEAGF P II DECAGF I & II	Practical based on P-XIII & P-XV P-XVII	04	Practicals 08 08	05 05	20 20	25 25	01 01
	DSEAGFP-III SECTION B	SEC IV			50		50	(02)*
	OR DSEAGF P- II	Practical based on PXV Elective	04	08	05	20	25	
				Total Credit			: 12 (04)* = 16	

Objectives:

India being a chiefly agrarian economy and focus of future development, the subject Agrochemicals and fertilizers is catering to the needs of the agricultural manpower in the region.

The revised syllabus at B.Sc. IIIrd year has been designed with well defined objectives.

- a. Agronomy and seed technology: aims to impart the knowledge of latest methods in agronomy to increase farm production. Seed technology will ensure the high quality of seeds to the farmers and its legal angles.
- b. Horticulture: production of fruits, vegetables and ornamental plants is the focus of the syllabus and aims at providing needs of population for better health.
- c. Vegetable production (Elective-I) aims at familiarizing students with importance and cultivation of vegetable to augment farmers income.
- d. Preservation of fruits and vegetables: The post harvest technology aims at storing and preserving the fruits and vegetables for avoiding losses and improve profitability of farming.
- e. Agricultural technology: it helps the students in knowing and using the improved form technologies like micro irrigation, green houses, soil and water conservation techniques.
- f. Hydroponics technology (Elective-II): It aim at providing knowledge about the advanced techniques of soilless culture and its significance for future of agriculture.

Course outcome:

1. Creation of skilled and trained manpower for agricultural sector.
2. Application of technology for higher production and profitability of farming.
3. Saving valuable natural produce like fruits and vegetables from spoilage and improving farm income.
4. Development of skills needed for future agriculture like hydroponics which will boost the intensive agriculture and production efficiencies.
5. Supplementing farm income by promoting vegetable production, storage and marketing and also helping in preserving the health of people by providing sufficient healthy foods like vegetables.
6. Knowledge resource persons for seed production industry.

Unit –I

1. Introduction to Agronomy 06
 Definition, Scope
 Relationship with other sciences Factors governing Crop Production
 Agro- climatic Zones of Maharashtra
2. Tillage and tillage implements : 05
 Introduction Objects of tillage, Type of tillage operations Tillage
 implements Modern concepts of tillage

Unit -II

3. Dry Land Management 06
 Introduction Importance
 Problems of dry land farming
 Management of dry land farming
 Water shed management - definition and objectives
4. Package of practices for important field crops 08
 Cotton Jowar (Sorghum)
 Sugarcane Soya bean

Unit –III

5. Introduction to seed Technology 06
 Definition of seed and seed technology Characteristics of good quality
 seeds Types of seeds
 Seed dormancy Seed treatment
6. General Principles of seed production 04
 Genetic Principles
 Agronomic Principles

Unit -IV

7. Seed certification and seed legislation 10
 Seed certification- objectives, fundamental concepts
 Organization of Seed certification. Seed certification agency
 General seed certification. Standards Seed testing
 Seed legislation in India.

Unit -I

1. Introduction to Horticulture 04
- Definition
 - Branches of horticulture
 - Importance and scope of horticulture in India

2. Propagation of horticulture crops 08
- Definition,
 - Principles and methods of propagation of fruit crops Propagation by seeds
 - Propagation by cuttings, grafting, budding, and layerage

Unit -II

3. Package of practices for important fruit crops of Maharashtra 08
- Mango Grapes
 - Banana Guava

Unit-III

4. Olericulture 07
- Definition
 - Scope and importance of vegetable growing
 - Classification of vegetable
 - Types of vegetable gardens

5. Package of Practices for important vegetable crops 10
- Chillies Onion
 - Tomato Brinjal
 - Bhendi(okra)
 - (Package of practices include area and production, varieties, climatic requirements cultivation practices, manuring, irrigation, plant protection and economic importance.)

5. Floriculture

08

Introduction

Methods of cultivation

Important flower crops of Maharashtra state

Handling, transportation and storage of floriculture products Export potential in floriculture

Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Credit System (CBCS) Course Structure B.
Sc. Third Year (Semester-VI) Semester Pattern effective
from June- 2021

Subject: Agrochemicals and Fertilizers

Elective Paper I

Paper No. XIII

Title : Vegetable production

Credits: 02 (Marks-50)

Periods: 45

Unit - I

- | | | |
|----|---|----|
| 1. | Importance of vegetables | 06 |
| | Introduction, Definition of vegetables Classification of vegetables | |
| | Scope and importance of vegetable growing | |
| 2. | Types of vegetable farming | 08 |
| | Home or kitchen gardening Commercial vegetable gardening | |
| | Vegetable gardening for seed production floating vegetable garden | |

Unit - II

- | | | |
|----|---|----|
| 3. | Vegetable seed production | 08 |
| | Qualities of good seed, Definition of terms | |
| | How to get good seed, Seed organization and its drawback Seed raising technique | |

Unit - III

- | | | |
|----|--|----|
| 4. | Storage of vegetables | 08 |
| | Principles of storage, Types of storage Physiological processes during storage | |
| | Losses during storage, Storage of some vegetables | |
| 5. | Harvesting and packing of vegetables | 07 |
| | Introduction, Definition | |
| | Post harvest deterioration of vegetables packing of vegetables | |
| | Kinds of packing, containers for vegetables | |

Unit - IV

- | | | |
|----|--|----|
| 6. | Vegetable Marketing in India | 08 |
| | Essentials of vegetable marketing Transportation of vegetables Methods of marketing in India Processing and Assembling | |
| | Defects of present system of marketing | |

Unit-I

1. Post harvest technology for fruits and vegetables 05
 Harvesting, storage and marketing of fruits
 Harvesting, grading, packaging, marketing and storage of vegetables

2. Preservation of fruits and vegetables 08
 Spoilage of fruits and vegetables Importance and Principles of Preservation
 Methods of Preservation
 Chemical preservatives – types and uses

Unit-II

3. Canning and bottling of fruits and vegetables 02
 Canned mango and canned vegetables

4. Fruit beverages 04
 Preparation of fruit juices ,squashes, cordials
 Preparation of orange and lemon squash

5. Preparation of jams & jellies 06
 Preparation of guava jelly, apple jam .mango jam, Amla jam

Unit-III

6. Drying and dehydration of fruits and vegetables 06
 Methods –sun drying, mechanical dehydration, drum drying Preparation of
 raisins from grapes. Banana products like chips and powders

7. Preparation and preservation of pickles 04
 Preparation of mango, lime, chilies and vegetable pickles.

Unit-IV

8. Preparation of crystallized fruits 04
 Preparation of Amala Candy

9. Preparation of Tomato products 02
 Tomato Ketchup and puree

10. Preparation of fermented vegetables

Paper –XV Agricultural Technology
(CH-AG-304)

Periods :45

Unit -I

1. Problematic soils 10
- Introduction to saline and alkali soils
 - Classification
 - Diagnostic criteria and causes of their formation adverse effects
 - Reclamation and management of saline and alkali soils
 - Introduction to acidic Soils, Sources of soil acidity
 - Reclamation of acidic soils

Unit -II

2. Hydroponics 04
- Methods of soil-less cultivation
 - Nutrient film technique (NFT)
 - Advantages and disadvantages of hydroponics
 - Applications of hydroponics in agriculture
3. Micro- propagation techniques 06
- Introduction, Types of micro- propagation
 - Techniques of tissue culture and its applications in agriculture

Unit – III

4. Green house technology 06
- Introduction,
 - Components and design of green houses Advantages.
 - Applications in agriculture
5. Micro-irrigation 08
- Introduction
 - Drip and sprinkler irrigation systems, their components Advantages
 - Their importance in water management

Unit –IV

6. Soil and water conservation 08
- Soil erosion- definition and types
 - Importance , Methods of soil and water management Waste land reclamation
 - Watershed management- definition and objectives
 - Water harvesting- definition , methods of water harvesting
7. Biopesticides 03
- Introduction , Types , Applications and importance

Swami Ramanand Teerth Marathwada University, Nanded
 Choice Based Credit System (CBCS) Course Structure
 B.Sc.Third Year (Semester-VI)
 Semester Pattern effective from June -2021
 Subject: Agrochemicals and Fertilizers
 Elective Course II
 Title: Hydroponics Technology

Chapter 1. What Is Hydroponics?...	5
A Brief History Of Hydroponics..	
Current Research..	
What All Gardeners Can Learn From NASA.	
It's All About The Roots	
Chapter 2.Hydroponic Mediums...	6
Coconut Coir Perlite. LECA.	
Perfect Starts. Rockwool.	
Chapter 3.Hydroponic Technology.	14
Sand And Gravel Culture. The Dutch Bucket Method.	
The Rockwool Slab Drip System. The Nutrient Film Technique (NFT).	
The Raft System. Ein Gedi System.	
Aeroponics. The Autopot.	
Vertical Gardening.	
Chapter 4.Plant Nutrition.	7
The Organic Composition Of Plants. Macro Nutrients .	
Micro Nutrients. Selecting A Hydroponic Nutrient.	
Making Your Own Nutrients. Maintaining Nutrient Concentration And pH.	
Nutrient Solution Microbiology. Supercharge Your Garden With CO2.	
CO2 And You. Do-It-Yourself CO2.	
Chapter 5.Light Requirements	5
High Intensity Discharge (HID) Lighting. Intensity.	
Duration (Photoperiod): Color (Photosynthetic spectrum) .	
Choosing A Grow Light.	

Chapter 6. Hydroponics As A Commercial activity

8

Making A Market For Your Garden. Investigate Your Local Market.
Product Quality Considerations. Approaching Prospective Customers.
Hydroponics -applications and customisation under Indian conditions

Laboratory Course –IV

Paper –XVI

(CH-AG-305)

Duration of practical –Four periods (At
least sixteen practicals are essential)

1. Study of tillage implements
2. Visit to the field to observe the package of practices for any field crop
3. Preparation of various types of nursery beds
4. study and practice of grafting technique
5. study and practice of budding technique
6. study and Practice of Layering Technique
7. Study and practice of propagation through cuttings
8. Study of garden tools and implements
9. Determination of seed moisture
10. Determination of germination percentage of seeds
11. Delinting of cotton seeds
12. Application of Azotobacter / Rhizobium culture on seed and observe their effect
on crops
13. Use of growth regulators in plant propagation
14. Visit to the fruit orchards /vegetable garden to study the package of practices
15. Visit to seed production plot
16. Visit to seed testing laboratory
17. Study of physical purity analysis of seeds
18. To study the seed germination methods. (C& P, B.P., Sand)
19. Filling of application form for seed certification
20. To study seed quality testing

Laboratory Course –V

Paper XVII

CH-AG-306

Duration of practicals -4 periods

(At least sixteen practicals are essential)

1. Preparation and use of soil testing kit for determination of available N,P, K
2. Estimation of total soluble salts in 1:2.5 soil water extracts.
3. Preparation and preservation of fruit juice
4. Preparation and preservation of squash
5. Preparation of fruit jam
6. Preparation of fruit jelly
7. Determination of gypsum requirement of soil
8. Determination of carbonates and bicarbonates from irrigation water
9. Determination of chlorides from irrigation water
10. Determination of sulphates from irrigation water
11. Determination of electrical conductivity of irrigation water /soil
12. Dehydration of Banana /Grapes
13. Preparation and preservation of pickles
14. Visit to the fruit preservation industry
15. Visit to the farm and diagnosis of field problems
16. Drying /dehydration of vegetables cabbage /potato /beans
17. Study of drip irrigation components /field visit
18. Study of sprinkler irrigation components /field visit
19. Determination of lime requirement of soil
20. Visit to green house to observe its design and working

Reference books for B.Sc. IIIrd year

1. Introduction to Agronomy –soil and water management.— Vaidhya and Sahasrabuddhe
2. Principles of Agronomy- Reddy and Reddi
3. Crop production and field experimentation – Vaidya and Saharabudhe and Khuspe
4. Seed Technology – Ratanlal Agrawal
5. Text book of Horticulture –K. Manibhushanrao
6. Basic Horticulture – Jitendrasingh
7. Fruit Growing - J.S. Bal
8. Fruit Physiology and Production- Amarsingh
9. Basic concept of fruit science –N.P.Singh
10. Fruits – Ranjeet Singh and Saxena
11. Floriculture in India –Randhwa and Mukhopadhyaya
12. Vegetable Growing –Chauhan
13. Vegetable science –Hazara and Som
14. Green house Technology –Arupratan Ghosh
15. Handbook of Saline and alkali soils -USDA
16. Vegetable Production in India- D.V.S.Chauhan
17. Vegetable growing in India – P.S. Arya and Santprakash
18. vegetable growing – Choudhary
19. Horticulture at glance- Amarsingh
20. Plant Propagation – Hertman et al
21. Preservation of fruits and Vegetables -Girdharilal and Tondon
22. Principles of fruit growing – Yawalkar and Kunte
23. Horticulture for competitive and college Exam- Suhas Diwase
24. Horticulture main book for Competitive Exam - R. N. Sable
25. Agriculture M.P.S.C. Main Exam- R. N. Sable
26. Foods and Nutrition – Sumati Mudambi
27. Plant Physiology- Pandey and Sinha
28. Plant physiology –Jain
29. Hand book of Agriculture –ICAR Publications

31. Drip Irrigation – WALMI Publication
32. How to Hydroponics-by Keith Roberto

Swami Ramanand Teerth Marathwada University, Nanded

Choice Based Credit System (CBCS) Course Structure

B. Sc. Third Year (Semester-V)

Semester Pattern effective from

June -2021

Subject: Agrochemicals and Fertilizers

SKILL ENHANCEMENT COURSE SECAGF-III

Title : Plant propagation techniques and their applications in Horticulture

Objective : To learn various propagation techniques for multiplication of commercially important fruit and flower plants.

Skill component: Learning and practising various propagation techniques like

- a. Budding
- b. Grafting
- c. Layerage
- d. Cutting

In various economically significant fruit and ornamental plants.

SKILL ENHANCEMENT COURSE SECAGF-III

Title : Preservation techniques for various fruits and vegetables.

Objective: To learn various preservation techniques for improving and increasing the storage life of various fruit and vegetables and converting them in to the products with longer shelf life.

Skill component : Learning and practising the various preservation techniques like

- a. Preparation and Preservation of fruit juices.
- b. Drying and dehydration of fruits and vegetables.
- c. Preparation of Jams
- d. Preparation of Jellies
- e. Preparation of Pickles.

Laboratory Course – IV

Paper – XVI

(CH-AG-305)

Duration of Practical – Four Periods

(At least Sixteen Practical are Essential)

- 1 Identification of seeds of different vegetable crops
- 2 Calculation of fertilizer requirement for vegetable crops
- 3 Identification of common tools and Implements used for land preparation
- 4 Calculation of Seed rate required for vegetable crops
- 5-6 Study of Package of practices for Tomato
- 7-8 Study of Package of Practices for Brinjal
- 9-10 Study of Package of Practices for Bhendi
- 11-12 Study of Package of Practices for Chilli
- 13-14 Study of Package of Practices for Onion
- 15 Visit to Polyhouse Culture
- 16 Visit to Floriculture Garden
- 17 Visit to Vegetable seed production plot
- 18 Study of Package of Practices for Leafy Vegetable (Methi) 19Study of Package of Practices for Leafy Vegetable (Palak)
- 20 Study of Seed Production Technology for Vegetable Crops.

Laboratory Course – V

Paper – XVII

(CH-AG-306)

Duration of Practical – Four Periods

(At least Sixteen Practical are Essential)

- 1 Study of Design and Components of Hydroponic System
- 2 Study of Working of Hydroponic unit 3 Study of Media Required for Hydroponic s
- 4-5 Study of Hydroponic techonology for Tomato
- 6-7 Study of Hydroponic techonology for Chilli
- 8-9 Study of Hydroponic techonology for Cucurbits
- 10-11 Study of Hydroponic techonology for Green Fodder Crop
- 12 Visit to Hydroponics Farming unit.
- 13-14 Study of Hydroponic techonology for Flower Cultivation
- 15 Preparation of Different Hydroponic Media
- 16 Study of Plant Tissue Culture and its application in agriculture
- 17-18 Study of Different types of Plant Propagation techniques
- 19 Preparation of different Media for Tissue Culture
- 20 Visit to Tissue Culture Laboratory