SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

ANNUAL PATTERN

SYLLABUS

Of

B. Sc. THIRD YEAR
HORTICULTURE

With Effect from June - 2010

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CURRICULUM, B. Sc. THIRD YEAR, HORTICULTURE

INTRODUCTION

Revising and updating of the curricula is the continuous process to provide an updated education to the students at large. Up till now there was wide diversity in the curricula of different Indian Universities which inhibited mobility of students in other universities or states. To ensure and have uniform curricula at UG levels in different Indian Universities, the UGC developed a model curriculum and forwarded the same to all the universities in the country to serve as a base in updating their respective curricula.

For developing the final draft of curriculum, the BOS in Horticulture took into account total number of teaching days available in a year and the guidelines given by the faculty of science of the S.R.T.M.U Nanded. The BOS in Horticulture held a couple of meetings in which there were thorough and critical discussions.

S.R.T.M.U. Nanded is having B.Sc. (General) Horticulture course. The course content has been designed on annual pattern.

The course content of each theory paper is divided into units and subunits by giving appropriate titles and subtitles. For each unit, total number of periods required and weightage of maximum marks is mentioned. At the end the list of selected reading material is provided. A list of practical exercises to be completed in the academic year is also given. Skeleton question paper for theory and practical examination is provided as a guideline to teachers, students and paper setters.

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CURRICULUM, B. Sc. THIRD YEAR, HORTICULTURE

OBJECTIVES

1. To evolve uniform curricula in all the universities of the country and to provide mobility to students from one university or state to other
2. To update curricula by introducing recent advances in the subject and enable the students to face NET, MPSC, UPSC and other competitive examinations successfully.
3. To create awareness among the students about the Horticulture and train them in the subject.
4. To improve the quality of laboratory and field work, for which study tours and excursions have been made compulsory so that the students can become familiar with the flora and ecosystems of that area.
5. To prepare such a dynamic curricula by incorporating innovative concepts and a multidisciplinary approach which can attract and develop interest among the students for selecting plant science as their career.

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CURRICULUM, B. Sc. THIRD YEAR, HORTICULTURE - AN OUTLINE

Sr. No.	Paper No.	Title of Paper	Periods/ Practicals	Time duration of Examin-- ation	Maxi- mum Marks
1.	Paper-VIII (Theory)	Fruit and vegetable technology	80	3 Hrs.	100
2.	Paper-IX (Theory)	Preservation of fruits and vegetables	80	3 Hrs.	100
3.	Paper-X (Practical)	Based on theory paper - VIII	24	4 Hrs.	100
4.	Paper-XI (Practical)	Based on theory paper - IX	24	4 Hrs.	100

Workload:

1. **Theory:** Per paper per week three periods
2. **Practical:** Per batch per week one practical (Three periods)

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CURRICULUM, B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Theory Paper – VIII
(Fruit and vegetable technology)

Periods – 80 Maximum Marks – 100

UNIT - I: TECHNOLOGY (20 PERIODS)

1. Importance of vegetables in human diet
2. Importance of fruits in human diet
3. Scope of vegetable gardening in India
4. Scope of fruit gardening in India
5. Classification of vegetables on the basis of type and nature of products
6. Classification of fruits on the basis of type and nature of products
7. Post harvesting, storage and marketing of vegetables and fruits.
8. Post harvesting, storage and marketing of vegetables and fruits.

UNIT - II: SPOILAGE AND CONTROL MEASURES (20 PERIODS)

- **Spoilage and Control Measures of Following Vegetables**

1. Carrot
2. Potato
3. Palak
4. Cauliflower
5. Tomato

- **Spoilage and Control Measures of Following Fruits**

1. Mango
2. Banana
3. Grape
4. Pomegranate
5. Papaya

UNIT - III: PREPARATION OF VEGETABLE PRODUCTS (20 PERIODS)

1. Tomato sauce
2. Tomato juice
3. Garlic paste
4. Ginger paste
5. Chilli pickle
6. Chilli thecha
7. Mixed vegetable pickle
8. Use of colour and flavors in vegetable products

UNIT - IV: PREPARATION OF FRUIT PRODUCTS (20 PERIODS)

1. Mango pulp
2. Mango leather
3. Grape raisins
4. Grape juice
5. Citrus squash
6. Citrus marmalades
7. Papaya jam
8. Wood apple jelly
9. Use of colour and flavors in fruit products

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CURRICULUM, B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Theory Paper – IX
(Preservation of fruits and vegetables)

Periods – 80 Maximum Marks – 100

UNIT - I: INTRODUCTION (20 PERIODS)

1. Importance and scope of vegetable preservation
2. Importance and scope of fruit preservation
3. Principles of preservation
4. Methods of preservation
5. Use of heat in preservation
6. Preservation containers (Glass containers, Steel containers, Plastic containers, Clay containers, Tin containers, China claywares)

UNIT - II: DEHYDRATION AND CANNING OF VEGETABLES (20 PERIODS)

- **Dehydration**

1. Indian Spinach
2. Methi
3. Lady's finger
4. Brinjal
5. Cucumber
6. Beans

- **Canning**

1. Pea
2. Tomato
3. Cauliflower
4. Cabbage

UNIT-III: SPOILAGE AND CONTROL MEASURES OF VEGETABLE AND FRUIT PRODUCTS (20 PERIODS)

- **Spoilage factors**

1. Temperature
2. Humidity
3. Fungi (Yeast, Moulds and other)
4. Bacteria

- **Control measures**

1. Careful harvest
2. Pre cooling
3. Drying
4. Cleaning

UNIT - IV: FOOD PRESERVATIVES AND QUALITY CONTROL (20 PERIODS)

- **Food preservatives**

1. Salt
2. Sugar
3. Vinegar
4. Potassium meta bisulphate (KMS)
5. Sodium benzoate
6. Citric acid

- **Quality control**

1. Food laws
2. Food sanitation
3. Quality control standards of ISI
4. Testing of quality – colour, flavor and nutritive value of fruit and vegetable products

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CURRICULUM, B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Practical Paper – X
(Based on theory paper - VIII)

Periods – 24 Maximum Marks – 100

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1. **Practical 1-2:** Harvesting, storage and marketing of vegetables (Carrot, potato, Palak, Cauliflower, Tomato).

2. **Practical 3-4:** Harvesting, storage and marketing fruits (Mango, Banana, Grape, Pomegranate, Papaya)

3. **Practical 5-7:** Identification and description of the fungi causing spoilage to the vegetables. (Carrot, Potato, Palak, Cauliflower, Tomato)

4. **Practical 8-10:** Identification and description of the fungi causing spoilage to the fruits. (Mango, Banana, Grape, Pomegranate, Papaya)

5. **Practical 11-16:** Preparation of vegetable products(Tomato sauce and juice, Garlic and Ginger paste, Chilli pickle and thecha, Mixed vegetable pickle, Use of colour and flavors in vegetable products)

6. **Practical 16-22:** Preparation of fruit products (Mango pulp and leather, Grape raisins and juice, Citrus squash and marmalades, Papaya jam, Wood apple jelly, Use of colour and flavors in fruit products)

7. **Practical 23-24:** At least one long and several local excursions to the Horticultural industries, local vegetable and fruit markets are compulsory. The excursion report is compulsory in the practical examination for evaluation. The report shall carry marks.

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
CURRICULUM, B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Practical Paper – XI
(Based on theory paper - IX)

Periods – 24 Maximum Marks – 100

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1. **Practical 1-4:** Dehydration and preservation of vegetables (Methi, Bhendi, Brinjal, Cucumber (Waluk), Beans)

2. **Practical 5-8:** Canning of vegetables (Pea, Tomato, Cauliflower, Cabbage)

3. **Practical 9-10:**Blending and preservation of juice of Thomson seedless, Bangalore purple, Anabeshahi

4. **Practical 11-15:**Identification and description of the fungi causing spoilage to the vegetable products (Tomato sauce and juice, Garlic and Ginger paste, Chilli pickle and thecha, Mixed vegetable pickle)

5. **Practical 16-20:**Identification and description of the fungi causing spoilage to the fruit products (Mango pulp and leather, Grape raisins and juice, Citrus squash and marmalades, Papaya jam, Wood apple jelly)

6. **Practical 21:** Study of preservation containers(Glass containers, Steel containers, Plastic containers, Clay containers, Tin containers, China clay wares)

7. **Practical 22:** Study of preservatives(Salt, Sugar, Vinegar, Potassium meta , bisulphite (KMS), Sodium benzoate, Citric acid

8. **Practical 23-24:** At least one long and several local excursions to the Horticultural industries, local vegetable and fruit markets are compulsory. The excursion report is compulsory in the practical examination for evaluation. The report shall carry marks.

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SELECTED READINGS

1.	Singh, Amar (1990)	Fruit physiology and Production	Kalyani publishers Ludhiana, India.
2.	K.Manibhushan Rao (1991)	Textbook of Horticulture	Mac Millan India Ltd. New Delhi
3.	Edmond, J.B.,T.L.Sen, F.S.Andrews, and R.G.Halfare(1977)	Fundamentals of Horticulture	Tata McGraw Hills New Delhi
4.	Prasad, S. and Kumar Y. (1998)	Principles of Horticulture	Agro Botanica, Bikaner 334003, India.
5.	Kunte, Y. N. and Yawalkar K.S. (1991)	Introduction of principles of fruit growing	Agri-Horticultural Publishing house 52, Bajaj Nagar, Nagpur - 440010.
6.	Vaidya, V.G. K.R. Sahastrabuddhe & V.S.Khuspe (1972)	Crop production and Field experimentation	Continental prakashan Pune 30.
7.	Anonymous (1967)	Handbook of agriculture	ICAR publication New Delhi.
8.	Potter N.N.	Food Science	-
9.	Nigrar G.S.	Nutritional fruit trees	-
10.	Singal	Hand book of Indian Horticulture	-
11.	Kalia Manorangana	Food processing	-
12.	Sing S.P.	Scientific Horticulture Vol. I & II	-
13.	Christopher E.P. (1968)	Introductory Horticulture	McGraw Hills book publishing company, Inc. New York - 68.
14.	Shoemaker, J.S. (1952)	General Horticulture	J.B.Lippinjj co. Philadelphia New York, 1952.
15.	Singh, Amar (1990)	Fruit physiology and Production	Kalyani publishers Ludhiana, India.
16.	K.Manibhushan Rao (1991)	Textbook of Horticulture	Mac Millan India Ltd. New Delhi
17.	Edmond, J.B.,T.L.Sen, F.S.Andrews, and R.G.Halfare(1977)	Fundamentals of Horticulture	Tata McGraw Hills New Delhi
18.	Prasad, S. and Kumar Y. (1998)	Principles of Horticulture	Agro Botanica, Bikaner 334003, India.
19.	Kunte, Y. N. and Yawalkar K.S. (1991)	Introduction of principles of fruit growing	Agri-Horticultural Publishing house

			52, Bajaj Nagar, Nagpur - 440010.
20.	Vaidya, V.G. K.R. Sahastrabuddhe & V.S.Khuspe (1972)	Crop production and Field experimentation	Continental prakashan Pune 30.
21.	Anonymous (1967)	Handbook of agriculture	ICAR publication New Delhi.
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23.	Nigrar G.S.	Nutritional fruit trees	-
24.	Singal	Hand book of Indian Horticulture	-
25.	Kalia Manorangana	Food processing	-
26.	Sing S.P.	Scientific Horticulture Vol. I & II	-
27.	Christopher E.P. (1968)	Introductory Horticulture	McGraw Hills book publishing company, Inc. New York - 68.
28.	Shoemaker, J.S. (1952)	General Horticulture	J.B. Lippin jj co. Philadelphia New York, 1952.
29.	Lal Cindhani	Preservation of fruits and vegetables	-
30.	Shrivastav P.P.	Preservation of fruits and vegetables	-
31.	Rajhan S.K.	Laboratory manual of Horticulture	-

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

SKELETON OF QUESTION PAPER

B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Theory Paper – VIII
(Fruit and vegetable technology)

Time: *Three hours* *Maximum Marks – 100*

Note: - *(i) Attempt all questions*
(ii) All questions carry equal marks
(iii) Draw neat and well labeled diagrams wherever necessary

Q.1.	Unit-I	Long answer	20
	OR		
	a) Unit-I	Short answer	10
	b) Unit-I	Short answer	10
Q.2	Unit-II	Long answer	20
	OR		
	a) Unit-II	Short answer	10
	b) Unit-II	Short answer	10
Q. 3.	Unit-III	Long answer	20
	OR		
	a) Unit-III	Short answer	10
	b) Unit-III	Short answer	10
Q.4.	Unit-IV	Long answer	20
	OR		
	a) Unit-IV	Short answer	10
	b) Unit-IV	Short answer	10
Q.5A.	Write Short Notes on any two of the following		10
	a) Unit-I		05
	b) Unit-II		05
	c) Unit-III		05
	d) Unit-IV		05
B.	Multiple Choice Questions (MCQ) -Ten		10

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ANNUAL PATTERN
Theory Paper – IX
(Preservation of fruits and vegetables)

Time: *Three hours* *Maximum Marks – 100*

Note: - *(i) Attempt all questions*
(ii) All questions carry equal marks
(iii) Draw neat and well labeled diagrams wherever necessary

Q.1.	Unit-I	Long answer	20
	OR		
	a) Unit-I	Short answer	10
	b) Unit-I	Short answer	10
Q.2	Unit-II	Long answer	20
	OR		
	a) Unit-II	Short answer	10
	b) Unit-II	Short answer	10
Q. 3.	Unit-III	Long answer	20
	OR		
	a) Unit-III	Short answer	10
	b) Unit-III	Short answer	10
Q.4.	Unit-IV	Long answer	20
	OR		
	a) Unit-IV	Short answer	10
	b) Unit-IV	Short answer	10
Q.5A.	Write Short Notes on any two of the following		10
	a) Unit-I		05
	b) Unit-II		05
	c) Unit-III		05
	d) Unit-IV		05
B.	Multiple Choice Questions (MCQ) -Ten		10

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SKELETON OF QUESTION PAPER

B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Practical Paper – X
(Based on theory paper - VIII)

Date: ***Batch No.***

Time: *Four hours* ***Maximum Marks:*** *100*

Note: - *(i) Attempt all questions*
(ii) All questions carry equal marks
(iii) Draw neat and well labeled diagrams wherever necessary

Q1. Prepare a package for marketing of the given vegetable and fruit samples of the specimen – **A** & **B** 20

Q2. Identify and describe one of the fungi causing spoilage of the given vegetable and fruit samples of the specimen – **C** & **D** 20

Q3. Prepare a vegetable / fruit product ---------- of the given sample of the specimen - **E** 20

Q4. Identify and describe the given spots – **F, G, H, I** and **J** 20
(Two spots each from Unit –I&II, One spot from Unit – III&IV
Three minutes for each spot to be given)

Q5. Submission 20
i. Record book 05
ii. Excursion report 05
iii. Submission. 05
iv. Viva - voce 05

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SKELETON OF QUESTION PAPER

B. Sc. THIRD YEAR, HORTICULURE

ANNUAL PATTERN
Practical Paper – XI
(Based on theory paper - IX)

Date: ***Batch No.***

Time: *Four hours* ***Maximum Marks:*** *100*

Note: - *(i) Attempt all questions*
(ii) All questions carry equal marks
(iii) Draw neat and well labeled diagrams wherever necessary

Q1.	Carry out the process of blending and preservation of the given sample of the specimen – **A**		20
Q2.	Carry out the process of canning of the given sample of the specimen – **B**		20
Q3.	Identify and describe one of the fungi causing spoilage of the given vegetable / fruit product of the specimen – **C**		20
Q4.	Identify and describe the given spots – **D, E, F, G** and **H** (From Unit –IV)		20
Q5.	Submission		20
	i.	Record book	05
	ii.	Excursion report	05
	iii.	Submission.	05
	iv.	Viva - voce	05

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