

DEPARTMENT OF BOTANY UNIVERSITY OF KASHMIR, SRINAGAR

The revised curriculum for **Fruit Preservation & Mushroom Cultivation** to be adopted for B. Sc 1st and 2nd Semester from the academic session 2015 and subsequently for B. Sc 3rd and 4th Semester from the academic session 2016 and B. Sc 5th and 6th Semester 2017.

Course Structure: The course will comprise of 6 papers, one paper in each semester to be named as **FPMC-01 to FPMC-06**. Each paper will be of 100 marks, 20 for internal assessment and 80 for external examination. For each semester there will be one practical course to be named as L-01 to L-06 worth 50 marks, out of which 25 will be for internal assessment and 25 for external examination. Students will have to submit their practical note books as well as a plant collection herbarium at the time of practical examination..

The revised curriculum is to be adopted for B. Sc 1st Semester from academic session 2015

- i. The question paper shall be of 2 1/2hrs duration
- ii. Each subject shall have internal as well as external components of examination.

Internal Examination at College Level

This test shall be called as Internal Assessment Test, it shall consist of two components:

- a. **Attendance**
- b. **Mid term test/assignment/project work**

The distribution of marks per semester is reflected in the table as under:

Theory (External)	80
Attendance (Internal)	5 marks: wherein distribution will be as 2 mark (75-80%) 3 marks (80-90%) 5 marks (90-100%)
Theory (Mid term test/ project work/assignment- Internal)	15 marks
Total (Internal Assessment)	5+15=20
G. Total (Internal+ External)	100

- i. Number of units to be covered under Internal Assessment Test shall be left to college concerned.
- ii. Composition of marks among three components of part (b) i.e. midterm examination/project work/assignment shall be decided by the college.
- iii. Student must have a minimum 75% of attendance in each semester.
- iv. Student has to secure minimum of 36% percent marks in midterm test/project work/assignment. If college offers all the three, the 36% pass percentage in each component shall be applicable.

External Examination

- i. For external examination the syllabus of each course will be divided into four equal units.
- ii. Examination will be conducted by the Controller of Examinations, University of Kashmir at the end of each semester
- iii. There will be two types of questions in the question paper i.e. medium and long answer type questions comprising of Section A and Section B, respectively
- iv. In Section “A” there will be four medium type questions, one question with internal choice from each unit. All the four questions will be compulsory.
- v. There will be four long answer type questions in Section “B”, one from each unit and the student will be required to attempt any two questions.
- vi. The distribution of marks is reflected in the table as under:-

Theory paper carrying 80 marks
Section A
4 medium answer type questions each carrying 12 marks (4x12) =48
Section B
2 long answer type questions each carrying 16 marks (2x16) =32
<u>Theory component</u>
Internal examination = 20 marks; Minimum pass marks=8
External examination = 80 marks; Minimum pass marks=32
Total (20+80) =100 marks
<u>Practical Component</u>
Internal Assessment: 25 marks; Minimum pass marks = 9
External Examination: 25 marks; Minimum pass marks = 9

- vi. Pass percentage shall remain unchanged i.e 36% for both internal and external examinations.
- vi. Re-evaluation scheme as provided under the existing statute shall ' remain unchanged. Eligibility shall be determined on the basis of 75 marks and 100 marks in case of theory paper carrying an aggregate 100 marks and 150 marks respectively. Internal Assessment shall not be subject to any re-evaluation.

The single paper in no way shall affect the present eligibility norms for promotion to the next class.

Private candidates

Private candidates shall be subject to same external examination pattern as is applicable to the candidates in regular mode. In the case of regular candidates the internal assessment marks shall be added with the marks secured in the external examination. Since, there won't be any internal assessment for the private candidates the marks of the candidates will be raised strictly in proportion to the percentage of marks obtained in the external examination.

Fruit Preservation & Mushroom Cultivation Syllabus Revised as per Semester scheme

FPMC-01 (B. Sc. 1st Semester)

Unit: I

1. General account of fungi with special reference to dibble fungi
2. Identification of edible and poisonous mushrooms

Unit: II

1. Morphology, physiology and life cycle of *Agaricusbisporous* and *Morchellaspp.*
2. History and scope of mushrooms growing in world, India and J & K State

Unit: III

1. Requirement for mushrooms cultivation with special reference to cultivation of temperate mushrooms.
2. Consensus on study of pasteurization

Unit: IV

1. Pre and post management methods and techniques in quality spawn making and its storage
2. Detailed study of casing Preparation and sterilization of casing materials

Laboratory course: L-01

1. Study morphological and reproductive characteristics of specimen of *Agaricus* Sp and *Ualis Morchella* Sp.
2. Study the permanent slides of *Agaricus* Sp and *Morchella* Sp.
3. Study of different techniques of preparation of compost and spawn for mushroom growth.

FPMC-02 (B. Sc. 2nd Semester)**Unit: I**

1. Crop management
2. Identification, prevention and control of important diseases, competitors, insect pests and physiological disorders

Unit: II

1. Compost preparation in detail
2. Storage and marketing of mushrooms

Unit: III

1. Nutritional value and economic importance of edible mushrooms.
2. Importance of mutation during various stages of mushroom cultivation

Unit: IV

1. Scope and importance of fruit and vegetable preservation in India and J&K
2. Role of Govt. agencies in promotion of food processing

Laboratory course: L-02

1. Study of the raw materials used for casing of mushrooms.
2. Study of specimens of different species of mushrooms.

FPMC-03 (B. Sc. 3rd Semester)

Unit: I

1. Causes of spoilage in fresh fruits and vegetables with their control measures with special reference to
 - (a) Spoilage due to yeasts and moulds
 - (b) Spoilage due to enzymes

Unit: II

1. Enzymatic browning and non enzymatic browning of fruits and vegetables
2. Peeling method viz; Hand peeling, Lye peeling and Mechanical peeling

Unit: III

1. Temporary and permanent preservative method of fruits and vegetables preservation
2. Canning and bottling of fruits and vegetables. Their merits and demerits

Unit: IV

1. Canning centers of Kashmir valley
2. Commercial canning of fruits and vegetables viz; Apples, Pear and Peas

Laboratory course: L-03

1. Visit to cold storage units and canning centers of the state/outside the State.
2. Preparation of Apple Jam.
3. Preparation of orange/lemon squash

FPMC-04 (B. Sc. 4th Semester)

Unit: I

1. Spoilage of canned fruits and Vegetables
 - (a) Biological spoilage
 - (b) Chemical spoilage

Unit: II

1. Preservation of fruit and vegetable by freezing irradiation with special consensus on freezing of pears, peas and onions

Unit: III

1. Drying and dehydration of fruits and vegetables
2. Merits and demerits of sun drying and dehydration

Unit: IV

1. Drying of apricot, apple rings, tomatoes, chilies and brinjal
2. Methods of trade of dried fruits and vegetables

Laboratory course: L-04

1. Preparation of syrups and Brines.
2. Testing of Blanching.
3. Sun-drying of apple, pear, apricots, tomato and brinjal.
4. Identification of machinery and equipment required for establishing a collage scale fruit preservation unit.

FPMC-05 (B. Sc. 5th Semester)

Unit: I

1. Classification of Modern Methods of Fruit and Vegetables Preservation
 - a) Physical Methods
 - b) Chemical Methods
 - c) By Fermentation
 - d) By other Methods

Unit: II

1. Cooking of Fruits and vegetables

- a) Definition of Cooking
- b) Objectives of Cooking
- c) Limitations of Cooking
- d) Classification of Cooking Methods:
 - i) By Moist Heat
 - ii) By Dry Heat
 - iii) Combination of Cooking Methods

Unit: III

1. Preparation and Preservation of the following Fruit Products

A. Fruit Jam

- a) Apple jam
- b) Cherry jam

- c) Plum jam
- d) Apricot jam
- e) Mixed Fruit jam

Unit: IV

1. Fruit Jelly

- a) Apple jelly
- b) Guava jelly
- c) Qualities of a Perfect jelly
- d) Difficulties of a perfect jelly
- e) Syneresis or weeping of jelly

2) Marmalade:

- a) Orange Marmalade

3) Preserves

- a) Quince Preserve
- b) Apple Preserve

Laboratory course: L-05

Preparation of various Fruit Products:

- a) Apple jam, Cherry jam, Plum jam
- b) Quince jelly
- c) Orange Marmalade
- d) Orange Squash
- e) Lemon Squash

FPMC-06 (B. Sc. 6th Semester)

Unit: I

- 1. Preservation of Fruits and Vegetables by Fermentation:
 - a) Preservation of Pickles
 - b) Role of salt, Vinegar and Lactic acid in Pickles making.
 - c) Mixed Vegetables Pickle
 - d) Carrot Pickles
 - e) Kinds of spoilage in pickle making

Unit: II

A) Classification of Beverages

- i) Refreshing
- ii) Nourishing

- iii) Stimulating
- iv) Soothing
- v) Appetising

Unit: III

B) Fruit Beverage

- i) Fruit Juice
- ii) Fruit Drink
- iii) Fruit Squash
- iv) Fruit Co-ordial
- v) Fruit Punch
- vi) Fruit Syrups
- vii) Fruit Juice Concentrate
- viii) Carbonate Fruit Beverages
- ix) Preparation of Orange and Lemon squash

Unit: IV

Preparation of Tomato Products

- i) Tomato Juice
- ii) Tomato Ketchup
- iii) Mixed Vegetables Sauce
- iv) Tomato Puree and Paste
- v) Tomato Cock-tail
- vi) Microbiology of Tomato Products.

Laboratory course: L-06

1. Preparation of various Fruit / Vegetable Products:
 - a) Tomato juice
 - b) Tomato sauce
 - c) Mixed Vegetables Pickles
 - d) Preserve (Apple)
 - e) Visit to Canning Centres of Kashmir Valley / Outside the valley.