

<b>INSTITUTE</b>	<b>FACULTY OF AGRICULTURE</b>
<b>PROGRAM</b>	<b>BACHELOR OF SCIENCE (Hons.) AGRICULTURE</b>
<b>SEMESTER</b>	<b>6</b>
<b>COURSE TITLE</b>	<b>POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES</b>
<b>COURSE CODE</b>	<b>16AS0608</b>
<b>COURSE CREDITS</b>	<b>2</b>

**Objective:**

- 1 To gain knowledge on various management technologies on pre- harvest and post harvest of fruits and vegetables.
- 2 To provide basic understanding of postharvest processing methods and processes involved in post harvest loss reduction.
- 3 To provide technical know-how on value addition of fruits/vegetables through different methods and to design storage structures for freshly harvested agricultural products in the field.

**Course Outcomes:** After completion of this course, student will be able to:

- 1 Student will be able to define the fundamentals application of post and pre harvest technologies in agricultural commodities and post harvest management and novel packaging techniques.
- 2 Student will be able to identify various problems (storage, shelf life of food product spoilage etc.) faced by the farmers.
- 3 Student will able to design and development of various products related to food processing or prevent the food from microorganism or enzymatic spoilage, i.e., self decomposition of the food by naturally occurring enzymes within it.
- 4 Students will learn to design and development of various products related to food processing.

**Pre-requisite of course:** Students should have basic knowledge regarding post-harvest management.

**Teaching and Examination Scheme**

<b>Theory Hours</b>	<b>Tutorial Hours</b>	<b>Practical Hours</b>	<b>ESE</b>	<b>IA</b>	<b>CSE</b>	<b>Viva</b>	<b>Term Work</b>
1	0	2	50	30	20	25	25

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>1</b> Importance of fruits and vegetables, extent and possible causes of post-harvest losses	1

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
2	<b>2</b> Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening	1
3	<b>3</b> Respiration and factors affecting respiration rate	1
4	<b>4</b> Role of ethylene	1
5	<b>5</b> Post harvest disease and disorders	1
6	<b>6</b> Harvesting and field handling	1
7	<b>7</b> Storage (ZECC, cold storage, CA, MA, and hypobaric)	1
8	<b>8</b> Value addition concept	1
9	<b>9</b> Principles and methods of preservation	1
10	<b>10</b> Intermediate moisture food: Jam, jelly, marmalade, preserve, candy- Concepts and Standards	2
11	<b>11</b> Fermented and non-fermented beverages	1
12	<b>12</b> Tomato products: Concepts and Standards Tomato products: Concepts and Standards	1
13	<b>13</b> Drying/ Dehydration of fruits and vegetables: Concept and methods, osmotic drying	1
14	<b>14</b> Canning: Concepts and Standards, packaging of products	1
<b>Total Hours</b>		<b>15</b>

#### **Suggested List of Experiments:**

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>1</b> Applications of different types of packaging containers for shelf life extension	2
2	<b>2</b> Effect of temperature on shelf life and quality of produce	2
3	<b>3</b> Demonstration of heat, chilling and freezing injury in vegetables and fruits	2

### Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	4 Extraction and preservation of pulps and juices	2
5	5 Preparation of jam, jelly, RTS, nectar, squash, osmotically dried products, fruit bar and candy and tomato products, canned products	2
6	6 Quality evaluation of products: physical, chemical and sensory	2
7	7 Visit to processing unit/ industry	2
<b>Total Hours</b>		<b>14</b>

### Textbook :

- 1 NA, NA, NA, NA

### References:

- 1 A Handbook on Post Harvest management of Fruits and Vegetables, A Handbook on Post Harvest management of Fruits and Vegetables, John, P. J., Daya Publishing House. Delhi., 2008
- 2 Postharvest Technology of Horticultural Crops, Postharvest Technology of Horticultural Crops, Kader, A. A. , UCUCANR Publications, 2002
- 3 Post-harvest management and processing of fruits and vegetables- Instant Notes, Post-harvest management and processing of fruits and vegetables- Instant Notes, Sharma, S. K., New India Publishing Agency, New Delhi, 2010
- 4 ostarvest technology of fruits and vegetables-General concepts and principles. Vol I & II, ostarvest technology of fruits and vegetables-General concepts and principles. Vol I & II, Verma, L. R. and Joshi, V. K., Indus Publishing Co., New Delhi, 2000

### Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
25.00	25.00	30.00	10.00	5.00	5.00

### Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by white board may also use any of tools such as demonstration, role play, quiz, brain storming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the class-rooms.

**Instructional Method:**

- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.