Department of Food Sciences
University of the Punjab, Lahore
Course Outline

Program	B.Sc. (Hons.) Food Science & Technology	**Course Code**	**FST-202**	**Credit Hours**	3(2-1)
Course Title	**Postharvest Technology**				

Course Introduction

Postharvest technology refers to the science and techniques used to manage and improve the quality and longevity of agricultural products after they have been harvested. This field encompasses a range of activities aimed at maintaining the freshness, safety, and nutritional value of crops and preventing spoilage.

Learning Outcomes

On the completion of the course, the students will come to know:

1. Basic introduction of postharvest technology.
2. Techniques used to minimize postharvest losses.
3. Properties of different fresh commodities.
4. Develop presentational skills through class participation and improve learning abilities of students with home assignments.

THEORY

	Course Content	Assignments/Readings
Week 1	**Unit-I** 1.1 Postharvest Technology: 1.1.1 Definition and introduction	
	1.1.2 importance and losses 1.1.3 postharvest losses and their causes	
Week 2	**Unit-II** 2.1 Factors affecting quality of fresh produce	
	2.1.1 Pre-harvest factors 2.1.2 Post harvest factors	
Week 3	**Unit-III** 3.1 Physiology of fresh produce:	

	3.1.1 Developmental stages of fruits and vegetables 3.1.2 Role of ethylene, enzymatic changes, respiration	
Week 4	**Unit-IV** 4.1 Classification of fruit and vegetables based on origin	
	4.1.1 Temperate, sub-tropical, tropical regions	
Week 5	**Unit-V** 5.1 Maturity assessment of different fruits	
	5.1.1 Various ways of detecting maturity and standards for different fruits	
Week 6	**Unit-VI** 6.1 Ripening process	
	6.1.2 Respiration, pectic substances, ripening conditions	
Week 7	**Unit-VII** 7.1 Harvesting and handling methods	
	7.1.1 Field handling and harvesting tools	
Week 8	**Unit-VIII** 8.1 Postharvest treatments for fresh produce:	

	8.1.1 Physical treatments	
	8.1.2 Chemical treatments	
Week 9	**Unit-IX** 9.1 Storage of fresh produce: 9.1.1 Undesirable changes in fresh produce during storage	
	9.1.2 traditional storage methods, Low temperature storage, CA, MAS	
Week 10	**Unit-X** 10.1 Packaging and transportation of fruit and vegetables: 10.1.1 Packaging material, functions	
	10.1.2 Packaging methods, MAP 10.1.3 Transportation methods 10.1.4 Cold chain	
Week 11	**Unit-XII** 11.1 Safety and Quality of Fruits	
	11.2 Vegetables	
Week 12	**Unit-XII** 12.1Safety and quality of fruits & v egetables	
	12.2 Industrial food waste management	
Week 13	**Unit-XIII** 13.1 General procedures for fruit and vegetable preservation	
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Week 14	**Unit-XIV**	

	14.1 Postharvest technology of cereals and grains 14.1.1harvesting, threshing, drying , storage and handling	
	14.1.2 Storage and transportation	
Week 15	**Unit-XV** 15.1 Developments in Post Harvest Technology	
	15.2 New developments in postharvest technology	
Week 16	**UNIT-XVI** 16.1 Climacteric and non-climacteric fruits	
	16.2 Various ways of detecting maturity and standards for different vegetables	

PRACTICAL

	Course Content	**Assignments/Readings**
Week 1	Determining harvest maturity of different fruits.	
Week 2	Determining harvest maturity of different vegetables.	
Week 3	Different maturity and harvesting indices of fruits	
Week 4	Different maturity and harvesting indices of vegetables	
Week 5	Applications of different postharvest techniques.	
Week 6	Determination of acidity in fruit samples	
Week 7	Changes in physical and chemical quality parameters of fruits during storage: weight loss, color changes, texture, acidity	
Week 8	Determination of pH of fruit juices	
Week 9	Determination of Vitamin C content in fruit juices	
Week 10	Changes in physical and chemical quality parameters of fruits during storage: weight loss, color changes, texture, acidity	

Week 11	Effect of packaging materials on stored fruits and vegetables.	
Week 12	Determination of total soluble solids	
Week 13	Changes in physical and chemical quality parameters of fruits during storage	
Week 14	Effect of different chemicals: Anti-sprouting and ant ripening	
Week 15	Effect of different chemicals: Anti-bacterial and anti-fungal	
Week 16	Changes in weight loss, color changes, texture, acidity	

Textbooks and Reading Material

1. Textbooks.

- Elhadi, Y. (2019). Postharvest Technology of Perishable Horticultural Commodities. Woodhead Publishing.
- Chakraverty, A., Mujumdar, A.S., Raghavan, G.S.V., Ramaswamy, H.S. (2003). Handbook of Postharvest Technology: Cereals, Fruits, Vegetables,Tea, and Spices. Marcel Dekker, Inc., New York, USA.
- Thompson, A.K. (2003). Fruit and Vegetables Harvesting, Handling and Storage. Blackwell Science Pub., Cambridge, UK.
- Wim, J. (2002). Fruit and Vegetable Processing: Improving Quality. Woodhead Publishing Ltd., Abington, Cambridge, UK.
- Awan, J.A. (2011). Food processing and preservation. Unitech Communications, Faisalabad, Pakistan.
- Awan, J.A.& Rehman, S.U. (2003). Food Analysis Manual. Unitech Communicatio Faisalabad, Pakistan.
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4006172/

Teaching Learning Strategies

1. White board and markers
2. Slide projector or multimedia
3. Overhead projector
4. Photocopy machine or photocopying facilities
5. Reference books
6. Journals
7. Internet (web sited literature)
8. Field Tours

Assignments: Types and Number with Calendar

- How can you reduce postharvest losses in Pakistan?
- Prepare charts to show various developmental stages of specific fruits and vegetables.
- Diseases responsible for spoilage of fresh produce.

Assessment			
Sr. No.	**Elements**	**Weightage**	**Details**
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.