

B.A. (Prog) with Food Technology (FT) as Major & Non-Major
Pool DSE: Even Semester

**DISCIPLINE SPECIFIC ELECTIVE – DSE-2-FT:
 POST HARVEST TECHNOLOGY**

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

| Course Title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|-------------------------|---------|-----------------------------------|----------|---------------------|----------------------|--------------------------------------|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Post Harvest Technology | 4 | 3 | 0 | 1 | Class XII Pass | NIL |

LEARNING OBJECTIVES:

4. To familiarize students with role of post-harvest technology.
5. To impart knowledge regarding the developmental dynamics of agricultural produce.
6. To acquaint students with technological approaches involved in reduction of post-harvest losses.

COURSE OUTCOMES:

Upon successful completion of this course, students will be able to:

1. Explain the principles of post-harvest technology
2. Illustrate the physiological and biochemical changes that occur during various stages of fruits and vegetables development and production
3. Understand the causes of post-harvest losses, and remedial methods to reduce them
4. Indicate the importance and the significance of proper post-harvest handling to maintain the quality of agricultural produce

SYLLABUS OF DSE-2-FT

THEORY
(Credits 3: 45 Hours)

UNIT I: Introduction to Post-Harvest Technology (9 Hours)

- *Unit Description:* This unit will introduce the students to the relevance and current status of post-harvest technology in global scenario.
- *Subtopics:*
 - Introduction to Post-harvest technology
 - Importance and need.
 - Status of post-harvest: Global scenario
 - Factors affecting quality of horticultural produce.
 - Pre-harvest (customization of produce by moulding method)
 - Harvest

- Post-Harvest

UNIT II: Physiology and Biochemistry of Horticultural Produce (10 Hours)

- *Unit Description:* This unit will focus on various physiological and biochemical changes in horticultural produce after harvest.
- *Subtopics:*
 - Physiology of horticultural produce
 - Respiration rate and associated factors
 - Biochemical and physiological changes during ripening and ethylene biosynthesis
 - Maturity indices in horticultural produce
 - Disorders in horticultural produce

UNIT III: Post-harvest Losses and Treatments for Prevention (17 Hours)

- *Unit Description:* This unit describes the post-harvest losses, associated factors and the treatments involved in reduction of such losses
- *Subtopics:*
 - Introduction and types of post-harvest losses
 - Factors responsible
 - Biological
 - Environmental
 - Post-harvest treatments
 - Pre-cooling
 - Cleaning, washing, dry-cleaning and dressing.
 - Curing, drying, vapor heat treatment and degreening
 - Dys-infection and sprout suppression
 - Wax-coating, astringency reduction and irradiation
 - Regulation of ripening

UNIT IV: Storage and Packaging (9 Hours)

- *Unit Description:* This unit will focus on storage and packaging techniques of horticultural produce.
- *Subtopics:*
 - Principles of storage.
 - Traditional (in situ, sand, coir, pits, clamps, windbreaks, cellars, barns, evaporative cooling, ZECC) and advanced storage methods (Controlled atmosphere Storage, Modified Atmospheric Storage, Cold storage).
 - Packaging of horticultural produce- material, techniques-basic and advanced.

PRACTICAL (Credits 1: 30 Hours)

No. of Students per Practical Class Group: 10-15

8. Classify any fruit(ex.-banana) based on physical maturity indices
9. Determination of firmness in fruits by penetrometer
10. Determination of the juice content in different maturity stages of fruit
11. Determination of fruit acids by titration and calculation of the sugar/acid ratio

12. Determination of the starch content of apples/pears using an iodine solution
13. Determination of pesticide residue in fresh farm produce by using chlorine test strips
14. Presentation on post-harvest management of any fruit/vegetable by application of low cost and modern techniques

OR

Visit to a nearby farm.

ESSENTIAL READINGS (Theory and Practical):

- Yahia, E. M., and Carrillo-Lopez, A. (Eds.). (2018). *Postharvest Physiology and Biochemistry of Fruits and Vegetables*. Woodhead Publishing.
- Wills, R., and Golding, J. (2016). *Postharvest: An Introduction to The Physiology and Handling Of Fruit And Vegetables*. UNSW press.
- Siddiq, M., Ahmed, J., Lobo, M. G., and Ozadali, F. (Eds.). (2012). *Tropical and Subtropical Fruits: Postharvest Physiology, Processing and Packaging*. John Wiley & Sons.
- Singh, I.S. (2009). *Post-Harvest Handling and Processing of Fruits and Vegetables*, West vill Publishing House.
- Chakraverty, A., Mujumdar, A. S., and Ramaswamy, H. S. (Eds.). (2003). *Handbook Of Postharvest Technology: Cereals, Fruits, Vegetables, Tea, And Spices* (Vol. 93). CRC press. <http://ecoursesonline.iasri.res.in/course/view.php?id=164>(accessed on 17.3.2023)
- FAO. Post-harvest system and food losses. <https://www.fao.org/3/ac301e/AC301e03.html>(accessed on 17.3.2023)
- FAO. Prevention of post-harvest food losses fruits, vegetables and root crops a training manual. <https://www.fao.org/3/t0073e/t0073e00.html>(accessed on 17.3.2023)

SUGGESTED READINGS:

- Wills, R. B., and Golding, J. (Eds.). (2016). *Advances in Postharvest Fruit and Vegetable Technology*. CRC press.
- Kitinoja, L., and Gorny, J. R. (1999). Postharvest technology for small-scale produce marketers: economic opportunities, quality and food safety. *Postharvest technology for small-scale produce marketers: economic opportunities, quality and food safety*.
- Kadar, A.A. (2002). *Post Harvest Technology of Horticultural Crops*, 2nd Edition, University of California.
- http://postharvest.org/PEF_Training_of_Postharvest_Trainers_Manual_2019_2Ed.pdf
- <https://agmarknet.gov.in/Others/CPBANANA.pdf>(accessed on 17.3.2023)
- <https://www.oecd.org/agriculture/fruit-vegetables/publications/guidelines-on-objective-tests.pdf>(accessed on 17.3.2023)

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.