



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Course / Subject Code: BV05009051

Subject Name: Food Storage - Lab

| | |
|--------------------------------|-------------|
| w. e. f. Academic Year: | 2026-27 |
| Semester: | 05 |
| Category of the Course: | Core Course |

| | |
|----------------------|--|
| Prerequisite: | NA |
| Rationale: | This course is intended to develop a fundamental understanding of food storage and handling systems, with a focus on the preservation of quality, safety, and shelf life of food products. It addresses key aspects such as post-harvest losses, handling and material movement operations, storage conditions, and modern storage technologies applicable to both perishable and non-perishable food commodities. |

Course Outcome:

After Completion of the Course, Student will able to:

| No | Course Outcomes |
|----|--|
| 01 | Identify and explain different food storage structures and storage systems used for cereals, fruits, vegetables, and processed foods. |
| 02 | Perform laboratory experiments to determine physical properties of food materials such as density, bulk density, porosity, and specific gravity related to storage behavior. |
| 03 | Evaluate the effect of temperature and relative humidity on the quality and shelf life of stored food products. |
| 04 | Conduct experiments related to controlled atmosphere, cold storage, and hermetic storage systems and analyze their impact on food quality. |
| 05 | Assess storage losses and quality changes in food products due to biological, physical, and environmental factors using experimental observations. |

Teaching and Examination Scheme:

| Teaching Scheme (in Hours) | | | Total Credits L+T+ (PR/2) | Assessment Pattern and Marks | | | | Total Marks |
|-------------------------------|---|----|------------------------------|------------------------------|-------------|----------------------|---------|----------------|
| L | T | PR | C | Theory | | Tutorial / Practical | | |
| | | | | ESE (E) | PA / CA (M) | PA/CA (I) | ESE (V) | |
| 0 | 0 | 02 | 1 | 00 | 0 | 20 | 30 | 50 |



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Course Content:

| Unit No. | Content | No. of Hours | % of Weightage |
|----------|---|--------------|----------------|
| 1. | Study of different food storage structures and storage systems. | 2 | 8 |
| 2. | Determination of moisture content of food materials during storage. | 2 | 7 |
| 3. | Determination of density and specific gravity of food products. | 2 | 7 |
| 4. | Determination of bulk density, true density and porosity of food materials. | 2 | 7 |
| 5. | Study of effect of temperature and relative humidity on stored food products. | 2 | 8 |
| 6. | Determination of respiration rate of fruits and vegetables during storage. | 2 | 7 |
| 7. | Study of packaging materials used for food storage. | 2 | 7 |
| 8. | Study of cold storage and refrigerated storage systems. | 2 | 7 |
| 9. | Hermetic storage and its effect on food quality. | 2 | 8 |
| 10. | Evaluation of different packaging methods. | 2 | 7 |
| 11. | Controlled atmosphere storage and quality evaluation of stored food products. | 2 | 7 |
| 12. | Study of effect the belt conveyors in food material handling | 2 | 7 |
| 13. | Study of effect the bucket conveyors in food material handling | 2 | 7 |
| 14. | Study of effect the screw conveyors in food material handling | 2 | 7 |
| 15. | Study of effect the pneumatic conveyors in food material handling | 2 | 8 |
| | Total | 30 | 100 |

Suggested Specification Table with Marks (Practical):

| Distribution of Practical Marks | | | | | |
|---------------------------------|---------|---------|---------|---------|---------|
| R Level | U Level | A Level | N Level | E Level | C Level |
| 10 | 10 | 10 | 10 | 10 | 0 |

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)



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References/Suggested Learning Resources:

(a) Books:

1. A.M. Michael and T.P. Ojha, *Principles of Agricultural Engineering*, Vol. I, Jain Brothers.
2. C.W. Hall, *Drying and Storage of Agricultural Crops*, AVI Publishing.
3. D.S. Jayas et al., *Stored Grain Ecosystems*, Marcel Dekker.
4. G. Boumans, *Grain Handling and Storage*, Elsevier.
5. A.K. Thompson, *Postharvest Technology of Fruits and Vegetables*.
6. K.M. Sahay & K.K. Singh, *Unit Operations of Agricultural Processing*

(b) Open-source software and website:

- 1) <https://agrimoon.com/wp-content/uploads/Engineering-Properties-of-Biological-Materials-and-FoodQuality.pdf>
- 2) https://ecourses.icar.gov.in/e-Leaarningdownload3_new.aspx?Degree Id=04
- 3) <https://ocw.mit.edu/courses/food-science-and-technology/>
- 4) <https://www.fao.org/postharvest-losses/en/>
- 5) <https://www.foodengineering.org/resources>

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