



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Course / Subject Code: BV05009031

Course / Subject Name: Storage and Handling of Food Products

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

Prerequisite:	Basic knowledge of Food material storage and handling.
Rationale:	This course aims to provide fundamental knowledge of storage and handling systems for food products with emphasis on maintaining quality, safety, and shelf life. The course covers post-harvest losses, handling operations, storage environments, and modern storage technologies for both perishable and non-perishable food products. Students will gain the ability to select and design suitable storage and handling systems for practical applications in food and agro-industries.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Understand the importance of storage and handling in maintaining food quality and safety.
02	Identify causes of food spoilage and methods to reduce post-harvest losses.
03	Apply appropriate handling and storage techniques for different food products.
04	Select suitable storage systems based on food type and environmental requirements
05	Understand and apply modern cold storage, CA and MA storage technologies.

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)	
03	00	00	03	50	0	0	0	50

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Introduction to storage and handling of food products	06	10



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	objectives of storage, post-harvest losses, factors affecting storage life, physical, chemical and biological causes of food spoilage.		
2.	Handling operations of food products Harvesting, pre-cooling, sorting, grading, packaging, transportation and material handling equipment used in food industries.	08	20
3.	Storage of cereal grains, pulses and oilseeds Bag storage, bulk storage, warehouses, silos, traditional and modern storage structures.	08	20
4.	Storage of fruits and vegetables Respiration, transpiration, chilling injury, storage conditions, ripening control, cold storage principles.	08	20
5.	Advanced storage systems: controlled atmosphere (CA), modified atmosphere (MA), hypobaric and hermetic storage systems; refrigeration and cold chain management.	08	20
6	Material handling equipment Belt conveyor, bucket conveyor, screw conveyor, pneumatic conveyor for	07	10
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	20	5	0	0	0

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

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.



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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:

Websites

- 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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