



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Course / Subject Code: BV05009061

Course / Subject Name: Processing of Grains - Lab

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

Prerequisite:	Provide basic knowledge for processing of cereals, pulses and oilseeds using different operations and machineries
Rationale:	The course provides students with practical understanding of key grain and food processing operations such as cleaning, grading, size reduction, mixing, drying, conveying, and milling, along with performance evaluation of related equipment. Experiments on particle size, fineness modulus, moisture content, and equilibrium moisture content help students link material properties with process efficiency, while studies on rice mills, dhal mills, oil mills, and an industry visit expose students to real processing systems and industrial practices, thereby strengthening their technical skills, analytical ability, and readiness for professional engineering roles.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Identify and explain the working principles and applications of different cleaning, grading, size reduction, conveying, elevating, mixing, and drying equipment used in grain and food processing.
02	Evaluate the performance of laboratory- and pilot-scale equipment such as air screen grain cleaner, indented cylinder separator, mixers, rice mill, dhal mill, and oil mill using appropriate performance parameters.
03	Determine and analyze particle size characteristics including fineness modulus and average particle size for materials subjected to size reduction operations.
04	Measure and interpret moisture-related properties of agricultural products, including moisture content and equilibrium moisture content (EMC), and relate them to drying behavior.
05	Operate and assess different mechanical dryers and understand their suitability for various food grains and processing conditions.
06	Correlate laboratory experiments with industrial practices through the study of integrated milling systems and a grain processing industry visit, enhancing practical skills and industry-oriented understanding.



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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)	
-	-	02	1	-	-	20	30	50

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Study of different types of cleaning/grading equipments	2	05
2.	Performance evaluation of laboratory scale air screen grain cleaner	2	05
3.	Study and performance evaluation indented cylinder separator	2	06
4.	Study of different types of size reduction equipments and performance evaluation	2	06
5.	Determination of fineness modulus and average particle size	2	07
6.	Study of different types of conveying and elevating equipments	2	06
7.	Study of different types of food mixers	2	07
8.	Performance evaluation of mixer	2	08
9.	Measurement of the moisture content of an agricultural product	2	07
10.	Determination of Equilibrium moisture content (EMC) of food grains	2	07
11.	Study on working of different types of mechanical dryers	2	09
12.	Study of different equipment in rice mills and performance evaluation	2	08
13.	Study of dhal mill and performance evaluation	2	06
14.	Study of different equipments in oil mills and performance evaluation	2	06
15.	Visit of grain processing industry	2	07
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
11	11	12	09	07	00

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. Chakraverty, A. Post Harvest Technology of cereals, pulses and oilseeds. Oxford & IBH publishing Co. Ltd., New Delhi.67
2. Dash, S.K., Bebartta, J.P. and Kar, A. Rice Processing and Allied Operations. Kalyani Publishers, New Delhi.
3. Sahay, K.M. and Singh, K.K. 1994. Unit operations of Agricultural Processing. Vikas Publishing house Pvt. Ltd. New Delhi.
4. Geankoplis C. J. Transport processes and unit operations, Prentice Hall of India Pvt Ltd, New Delhi
5. Earle, R.L. 2003. Unit Operations in Food Processing. Pergamon Press. Oxford. U.K.
6. Henderson, S.M., and Perry, R. L. Agricultural Process Engineering, Chapman and hall, London
7. McCabe, W.L., Smith J.C. and Harriott, P. Unit operations of Chemical Engineering. McGraw Hill.
8. Singh, R. Paul. and Heldman, R.Dennis. 2004. Introduction to Food Engineering. 3rd Edition. Academic Press, London.
9. Brooker, D.B., Bakker-Arkema,F.W., Hall, C.W. 1992. Drying and storage of grains and oilseeds, AVI publication

(b) Open-source software and website:

1. <https://nptel.ac.in/courses/126/103/126103017/>
2. https://www.youtube.com/watch?v=ZwBoZVrZxbk&list=PL2E9_TIQKsGRQv05HBihSowy1WP9HBtdy
3. <https://www.digimat.in/nptel/courses/video/126105011/L12.html>
4. <https://nptel.ac.in/courses/126105015/>

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