GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV04009021

Subject Name: Milling of Cereals

w. e. f. Academic Year:	2025-26
Semester:	04
Category of the Course:	Core Courses

Prerequisite:	Basic knowledge of milling of major cereals, including rice, wheat, and maize etc.
Rationale:	The course explores the principles and techniques of milling of cereals with improving the durability of the milled products for storage, and enhance economic value. It emphasizes innovative rice dehusking techniques, wheat milling techniques in the food industry. The courses discussed the cereals based value added products.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Develop basic entrepreneurial skills for establishing and managing cereal processing units.
02	Remember principles of engineering, size reduction, separation, and process optimization in cereal milling operations.
03	Analyze the factors affecting milling efficiency, yield, and quality of milled products.
04	Assess industrial practices, by-product utilization (bran, germ, husk), and sustainability issues in cereal milling.

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA/CA (M)	PA/CA (I)	ESE (V)	
3	0	0	3	50	0	0	0	50

GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV04009021

Subject Name: Milling of Cereals

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Introduction to Cereals:** Botany and morphology of cereals and compositions (bran, germ, endosperm) of major cereals, including wheat, rice, maize, barley, oats, sorghum, and millet.	7	15
2.	**Principles and Operations of Cereal Milling** Unit operations include cleaning, screening, grading, and conditioning of cereals. Principles of size reduction (Rittinger's, kicks, and Bond's law), crushing efficiency, and energy requirement. paddy separator, bran separator, stone separator, magnetic separator.	15	30
3.	**Milling Equipment and Technologies** Modern equipment: roller mills, hammer mills, impact mills, abrasive polishers. Rice milling machines: rubber roller sheller, dehusker, whitener, polisher, grader, wet-milling and dry-milling of corn, wheat milling: break and reduction roller.	15	30
4.	**By-products from cereals and applications in food.** Types of by-products generated from husk, bran and germ, rice bran oils extraction methods, and their nutritional profile. Nutritional properties of rice, wheat, barley, and oat bran. Importance of parboiling of rice and its methods, use of semolina in human diet.	8	25
	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	**15**	**0**	**10**	**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. Unit operation of agricultural processing by K M Sahay and K K Singh
2. Post-Harvest Technology of cereals, pulses, and oilseeds by A. Chakraverty

(b) Open-source software and website:

1. Not available

Websites

1. NPTL courses on cereal processing are available.

Suggested Project List:

1. Effect of conditioning (tempering time and moisture) on milling quality of wheat/rice/maize.
2. Impact of parboiling on milling yield of different rice varieties.
3. Optimization of wheat roller milling process for flour yield and quality.

Suggested Activities for Students:

1. Fortification of wheat flour with micronutrients.
2. By-product utilization in cereal milling (bran, germ, husk)."
3. Visit to a rice mill
4. Visit to a wheat roller flour mill

* * * * * * *