



Gyanmanjari
Innovative University

Course Syllabus

Gyanmanjari Institute of Technology
Semester-5

Subject: Processing of Agricultural Produce - BETFT15310

Type of course: Professional Core

Prerequisite: Basic knowledge of food engineering, post-harvest physiology, and agricultural commodities.

Rationale: Processing of Agricultural Produce focuses on transforming raw farm products into value-added foods through primary, secondary, and advanced techniques to minimize losses, enhance shelf-life, and meet market demands. With India's vast agricultural output facing post-harvest wastage, this course equips students to apply engineering principles for efficient processing of grains, fruits, vegetables, and other produce, promoting food security and economic growth.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.



Course Content:

Unit No.	Course content	Hours	%Weightage
1	Principles of Post-Harvest Processing Post-harvest losses and importance; Cleaning, sorting, grading; Drying and dehydration methods; Milling of cereals and pulses; Storage principles.	14	20
2	Processing of Cereals, Pulses, and Oilseeds Cereal processing (rice, wheat, maize); Pulse milling and germination; Oilseed extraction, refining; By-product utilization.	15	30
3	Fruits and Vegetable Processing Minimal processing, blanching, juicing; Canning, freezing, drying; Concentration and dehydration; Enzyme inactivation.	15	20
4	Advanced Techniques and Plantation Crops Spices and plantation crops (tea, coffee); Fermentation processes; Extrusion cooking; Emerging technologies (ohmic heating, pulsed fields); Waste management.	16	30

Continuous Assessment:

Sr. No.	Active Learn	Marks
1	Presentation: Make presentation on Post-harvest loss mitigation strategies and submit on GMIU portal.	10
2	Process flow simulation: Design milling/juice extraction line and Submit on GMIU portal.	10
3	Case study: Indian agro-processing industry analysis make a report and Submit on GMIU Portal.	10
Total		30

Suggested Specification table with Marks (Theory): 60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20%	40%	30%	10%	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from the above table.



List of Practical

Sr. No.	Title	Hours
1	To study cleaning, sorting, grading of cereal grains and determine process efficiency	2
2	To determine drying characteristics of grains using hot air oven method	2
3	To demonstrate rice milling process including pearling, polishing and calculate head rice yield	2
4	To perform parboiling of paddy, drying and evaluate nutritional quality changes	2
5	To study pulse processing: cleaning, dehusking, splitting and calculate dhal recovery percentage	2
6	To extract oil from oilseeds using mechanical expeller press and analyze crude oil characteristics	4
7	To study blanching effect on enzyme inactivation (peroxidase) in selected vegetables	2
8	To prepare pineapple/mango juice, measure extraction yield and physicochemical properties	4
9	To perform osmotic dehydration of apple slices using sugar syrup and assess dehydration ratio	4
10	To grind black pepper/cumin seeds, prepare powder and determine particle size distribution	2
11	To demonstrate black tea processing: withering, rolling, fermentation and drying steps	2
12	To study coffee processing: pulping of cherries, wet fermentation, roasting of beans	2
Total		30

Course Outcome:

After learning the course, the students should be able to:	
CO1	Understand post-harvest handling and primary processing techniques.
CO2	Apply processing methods for cereals, pulses, and oilseeds.
CO3	Process fruits, vegetables, and related products effectively.
CO4	Utilize advanced technologies for plantation crops and innovations.

Instructional Method:

- The course delivery method will depend upon the requirement of content and the need of students. The teacher in addition to the conventional teaching method by blackboard, may also use any of the tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- From the content, 10% of topics are suggested for flipped mode instruction.
- Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.
- The internal evaluation will be done based on the Active Learning Assignment.



Reference Books:

- [1] Agro-Processing and Food Engineering by Harish Kumar Sharma and Navneet Kumar
- [2] Handbook on Agro Food Processing by A. K. Singh
- [3] Processing of Fruits and Vegetables by K. P. Prasanna et al.
- [4] Technology of Cereals, Pulses, and Oilseeds by G. S. T. Bains
- [5] Post-Harvest Technology of Horticultural Crops by K. L. Chadha

