

Annexure I: Course Curriculum

TABLE 1: MODULE-WISE COURSE CONTENT AND OUTCOME				
SL.NO	Module Name	Module Content	Module Learning Outcome	Duration (Hrs)
1	Introduction to Sustainable Food Development	<ul style="list-style-type: none"> - Importance of sustainability in the food industry - Current trends and challenges in sustainable food production - Principles of sustainable product development 	Understand the need for sustainability and its application in food products	9
2	Sustainable Ingredient Sourcing	<ul style="list-style-type: none"> - Alternative protein sources (plant-based, lab-grown) - Locally sourced and organic ingredients - Reducing food waste through ingredient selection 	Identify and utilize sustainable ingredients for food production	9
3	Innovative Food Product Design	<ul style="list-style-type: none"> - Techniques for creating innovative food products - Balancing nutrition, taste and sustainability - Case studies on successful sustainable food products 	Develop innovative and sustainable food products	9
4	Sustainable Production Practices	<ul style="list-style-type: none"> - Energy-efficient manufacturing techniques - Water conservation in 	Apply sustainable practices in food production	6

		<p>food production</p> <ul style="list-style-type: none"> - Waste management and by-product utilization 		
5	Packaging and Lifecycle Assessment	<ul style="list-style-type: none"> - Eco-friendly packaging materials - Reducing carbon footprint in packaging - Lifecycle assessment of food products 	Design sustainable packaging and assess environmental impact	6
6	Market Trends and Regulatory Standards	<ul style="list-style-type: none"> - Market demand for sustainable products - Labeling and certifications (organic, fair trade, etc.) - Understanding regulatory compliance in sustainable food production 	Align product development with market needs and regulatory standards	6

Annexure II: Use Cases and Test Projects

TABLE 2: OVERALL COURSE LEARNING OUTCOME ASSESSMENT CRITERIA AND USECASES			
LEARNING OUTCOME	ASSESSMENT CRITERIA	PERFORMANCE CRITERIA	USECASES
Sustainability Principles in Food	<ul style="list-style-type: none"> - Explain the importance of sustainability in food production - Identify challenges and opportunities 	Demonstrates clear understanding of sustainability principles and identifies actionable areas for improvement	Sustainability Analysis Report: Evaluate the sustainability practices of a food product from the market.
Ingredient Sourcing	<ul style="list-style-type: none"> - Select sustainable raw materials and alternative ingredients - Develop a plan to minimize food waste 	Creates a comprehensive ingredient sourcing plan focusing on cost-effectiveness, sustainability, and waste reduction	Ingredient Sourcing Plan: Create a sourcing plan for a plant-based protein snack using locally available ingredients.
Innovative Food Product Design	<ul style="list-style-type: none"> - Create innovative food products balancing sustainability, taste, and nutrition 	Develops a functional prototype that meets sustainability, taste, and nutritional criteria	New Product Prototype: Develop a prototype of a sustainable food product, such as a zero-waste energy bar.
Sustainable Production Practices	<ul style="list-style-type: none"> - Apply energy-efficient and waste-reducing methods in production 	Designs an eco-friendly production process with measurable reductions in energy and resource usage	Eco-Friendly Manufacturing Plan: Design a manufacturing process for a product with reduced energy and water usage.
Packaging and Lifecycle Assessment	<ul style="list-style-type: none"> - Select eco-friendly packaging and perform lifecycle analysis 	Creates innovative packaging solutions that are cost-effective,	Green Packaging Design: Create a sustainable packaging solution for a new product,

		sustainable, and compliant with lifecycle analysis	considering materials and environmental impact.
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TABLE 3: LIST OF FINAL PROJECTS

SL.NO	FINAL PROJECT NAME	DESCRIPTION
1	Plant-Based Protein Snack	Develop a plant-based protein snack using locally sourced, organic ingredients, balancing taste, nutrition and sustainability.
2	Zero-Waste Energy Bar	Create a zero-waste energy bar by utilizing food by-products like fruit peels or grain husks, reducing ingredient wastage.
3	Sustainable Beverage Development	Design a nutritionally enhanced beverage using alternative sweeteners and eco-friendly packaging to minimize environmental impact.
4	Gluten-Free Sustainable Bread	Produce a gluten-free bread using sustainable grains such as quinoa or millet, while ensuring good texture and shelf stability.
5	Eco-Friendly Food Packaging Solution	Design sustainable packaging for a food product using biodegradable or compostable materials, considering environmental impact and usability.
6	Lifecycle Analysis of a Food Product	Conduct a lifecycle assessment for a selected food product to evaluate its environmental footprint and suggest improvements in sourcing and production.
7	Sustainable Meal Kit	Create a sustainable meal kit concept, including recipe cards, pre-measured ingredients and recyclable or reusable packaging.
8	Functional Food Product	Develop a functional food product enriched with probiotics or omega-3s, using sustainable production and packaging methods.
9	Ready-to-Cook Plant-Based Meal	Design a ready-to-cook meal featuring sustainable plant-based proteins and minimal packaging waste.
10	Organic Dessert Innovation	Create an organic dessert with innovative ingredients like natural sweeteners and sustainable dairy alternatives, ensuring a low carbon footprint.

Annexure III: Assessment Rubrics

TABLE 4: COURSE ASSESSMENT RUBRICS (TOTAL MARKS: 70)				
ASSESSMENT CRITERIA	FAIR	GOOD	EXCELLENT	MARKS
Sustainability Principles in Food	Basic understanding of sustainability concepts	Competent application of sustainability in product evaluation	Advanced analysis of sustainability across all stages of product lifecycle	15
Ingredient Sourcing	Limited understanding of sustainable raw materials	Competent sourcing plan with eco-friendly alternatives	Advanced sourcing strategy with zero-waste approaches	10
Innovative Food Product Design	Basic food product prototype with limited innovation	Competent product design balancing taste, nutrition and sustainability	Advanced product innovation with unique ingredients and processes	15
Sustainable Production Practices	Basic understanding of eco-friendly production methods	Competent application of energy-efficient and waste-reducing techniques	Advanced production process with measurable sustainability outcomes	15
Packaging and Lifecycle Assessment	Basic selection of eco-friendly packaging materials	Competent packaging design considering environmental impact	Advanced lifecycle analysis and comprehensive green packaging solution	15