Food Product Development

Course Code	Title of Course	Credit Hours
HND-326	Food Product Development	3(1-2)

Learning Outcomes

Students will be able to:

- Evaluate and apply knowledge of consumers' food choices, food trends and nutrition-related health issues to the design and development of a new food product
- Provide knowledge about novel food products with competitive advantages.
- Execute computer-aided statistical approaches in food product design and optimization
- apply principles of food science in development of innovative nutritious product
- Comprehend various consumer needs and wants for successful product development.
- Develop novel food products with competitive advantages
- Conduct testing in an appropriate market and evaluate consumer response

Course Contents:

Theory:

Introduction to food product design and development; Product development process; Innovation strategy development; Food Product Formulation: Enhancement of nutritive value, waste utilization, cost effectiveness; Sensory product attributes: Determination of sensory evaluation methods for evaluating quality, Developing score card as an evaluation tool; Threshold concentrations of primary tastes; Effect of Temperature on taste; Identification of samples through Difference, Descriptive and Affective testing; Food product design using computer-aided statistical approaches: Modelling of food quality attributes, types of models, applications of models to reactions in foods, Optimization by Response Surface Methodology; Food packaging design and types: Identifying suitable packaging material, Modelling in package design, shelf-life studies in various altered conditions; Consumer in product development: Understanding consumer behavior and food choice, tackling consumer preferences, Societal setting, Consumer's avoidance and acceptance of new products, integrating consumer needs and 76 wants in product development; Special project on formulation and preparation of a nutritious product development.

Practical:

Introduction to Food Product Development Process: Overview of lab objectives, safety, and hygiene practices, Understanding stages of food product development, Market Research and Idea Generation, Identifying consumer needs, food trends, and nutrition gaps, Formulation of a New Food Product, Selection of ingredients based on nutritional goals and cost-effectiveness, Application of waste utilization concepts in formulation, Enhancement of Nutritional Value, Incorporation of functional or fortifying ingredients (e.g., fiber, vitamins, plant proteins), Calculation of proximate and nutrient composition using food composition tables, Sensory Evaluation Techniques, Developing sensory score cards (color, flavor, texture, taste, appearance), Conducting difference, descriptive, and affective tests. Product Packaging and Label Design, Selection of suitable packaging materials, Designing a nutrition facts label and attractive packaging layout, Shelf-life and Stability Testing

Suggested Readings:

Textbook:

1. David Julian McClements, Lutz Grossmann. (2022). Next-Generation Plant-based Foods: Design, Production, and Properties. Springer Publisher.

Reference Books:

1. Francisco J. Barba, Giancarlo Cravotto, Farid Chemat, José Manuel Lorenzo Rodriguez, Paulo Eduardo Sichetti Munekata. (2021). Design and Optimization of Innovative Food Processing Techniques Assisted by Ultrasound: Developing Healthier and Sustainable Food Products.Academic Press.

2. Cecilia Y. Saint-Denis. (2018). Consumer and sensory evaluation techniques: how to sense successful products. John Wiley & Sons Ltd.

3. Debasis Bagchi and Sreejayan Nair. (2017). Developing New Functional Food and Nutraceutical Products. Academic Press. Elsevier

4. Fadi Aramouni and Kathryn Deschenes.(2015). Methods for developing new food products an Instructional Guide. Destech Pubns Inc.

5. Fuller, G., W. (2011). New Food Product Development from Concept to Marketplace. Boca Raton, FL: CRC Press.

6. Lawless, H. and Heymann, H. (2010). Sensory Evaluation of Food-Principles and Practices. Springer Science, New York.

7. Howard R. Moskowitz, Michele Reisner and John Ben Lawlor. (2009). Packaging research in food production design and development. Blackwell Publishing, John Wiley & Sons.