

**Department of Food Sciences**  
**University of the Punjab, Lahore**  
**Course Outline**



<b>Program</b>	<b>B.Sc. (Hons.) Food Science &amp; Technology</b>	<b>Course Code</b>	<b>FST-407</b>	<b>Credit Hours</b>	3(1-2)
<b>Course Title</b>	<b>FOOD PRODUCT DEVELOPMENT</b>				
<b>Course Introduction</b>					
<p>This course will complement the Food Product Development course by further assisting students in gaining a comprehensive understanding of the principles and process of food product development. Students will use the food science and marketing theories obtained from the Food Product Development course to put into practice and gain real life experience in the planning, conducting, and communicating results as a team while developing a pre-approved food product. At the end of the course, student will have produced a marketable food product and will be able to “sell” their product to potential retailers, brokers or distributors.</p>					
<b>Learning Outcomes</b>					
<p>Students graduating with BS Food Science and Technology shall be able to:</p> <ol style="list-style-type: none"> <li>1. Reflect on the role of food trends in the new product development process;</li> <li>2. Design a food product through the application of knowledge of food ingredients and functional foods;</li> <li>3. As part of a team, create and evaluate a product using the development process;</li> <li>4. Design and apply packaging for food products;</li> <li>5. Evaluate product quality and sensory properties;</li> <li>6. Combine theoretical knowledge and practical skills to reproduce existing food products.</li> </ol>					
<b>THEORY</b>					
<b>Course Content</b>					<b>Assignments/Readings</b>
<b>Week 1</b>	<b>Unit-I</b> 1.1 Accelerating Food Product Design and Development				Jacqueline H. Beckley, Chapter: 9

	1.2 Applying Processes That Accelerate New Product Development	
<b>Week 2</b>	<b>Unit-II</b> 2.1 Optimizing Food Product Design and Development	Jacqueline H. Beckley, Chapter: 13
	2.2 Identifying Critical Steps in the New Product Development Process	
<b>Week 3</b>	<b>Unit-III</b> 3.1 Understanding Product Development in Today's Food Industry,	Jacqueline H. Beckley, Chapter: 1, 2
	3.2 How Did the Food Industry Get (from There to Here)	
<b>Week 4</b>	<b>Unit-IV</b> 4.1 Developing Partnerships	Class assignments
	4.2 Using Outside Resources for Product Development	
<b>Week 5</b>	<b>Unit-V</b> 5.1 Building Superior R&D Organizations	Jacqueline H. Beckley, Chapter: 4
	5.2 R&D Skill Levels	
<b>Week 6</b>	<b>Unit-VI</b> 6.1 A Supplier Perspective:	Quiz
	6.2 Superior Services and Products Help Change Happen	
<b>Week 7</b>	<b>Unit-VII</b> 7.1 Brands	Jacqueline H. Beckley, Chapter: 7
	7.2 Pragmatics—How to Discover Meaning for a Brand	
<b>Week 8</b>	<b>Unit-VIII</b> 8.1 Market Forces	Jacqueline H. Beckley, Chapter: 8
	8.2 The Push-Pull of Marketing and Advertising in the New Product Business	
<b>Week 9</b>	<b>Unit-IX</b> 9.1 Speed Bump or Opportunity	

	9.2 Innovative Packaging and Its Impact on Accelerated Product Development Time	Jacqueline Beckley, Chapter: 11	H.
<b>Week 10</b>	<b>Unit-X</b> 10.1 Making Lemon Bars Out of Lemons	Jacqueline Beckley, Chapter: 12	H.
	10.2 Using the Power of Teamwork to Transform Concepts to Reality		
<b>Week 11</b>	<b>Unit-XI</b> 11.1 One Company's Perspective on Innovation—Starbucks Coffee	Jacqueline Beckley, Chapter: 6	H.
	11.2 Establish Your Company Profile		
<b>Week 12</b>	<b>Unit-XII</b> 12.1 Key to new product success and failure	Research articles	
	12.2 The Product Creation Process		
<b>Week 13</b>	<b>Unit-XIII</b> 13.1 Consumer in food product development	Frewer, chapter 14	L
	13.2 Consumer behavior, food choices, sensory needs consumer role.		
<b>Week 14</b>	<b>Unit-XIV</b> 14.1 Preference mapping and food product development	Frewer, chapter 15	L
	14.2 Conducting trials, analyzing, recent developments		
<b>Week 15</b>	<b>Unit-XV</b> 15.1 Response Surface Methodology and Consumer Driven Product Optimization	Class assignment	
	15.2 Category Appraisal and Ingredient Search		
<b>Week 16</b>	<b>Unit-XVI</b> 16.1 Accelerating and Optimizing New Food Product	Jacqueline Beckley, Chapter: 18 Quiz	H.
	16.2 Design and Development Status and State of the Industry: Do You Rent or Buy		
<b>PRACTICAL</b>			
<b>Course Content</b>		<b>Assignments/Readings</b>	
<b>Week 1</b>	Food product development introduction and considerations and group designation		

<b>Week 2</b>	Produce a food product and conduct sensory evaluation and make improvements on the product	
<b>Week 3</b>	Analyze new food products introduced into the market within the last year and compare them to competitive counterpart	
<b>Week 4</b>	Food product development projects: assigning the projects to individual group	
<b>Week 5</b>	Food project strategy and planning	
<b>Week 6</b>	Project team work on product. Design concepts	
<b>Week 7</b>	Project team work on the product. Product formulation development	
<b>Week 8</b>	Project team work on the product. Product formulation development	
<b>Week 9</b>	Project team work on the product. Product formulation development	
<b>Week 10</b>	Project team work on the product. Process flow diagram and operation regimes	
<b>Week 11</b>	Project team work on the product. Product quality evaluation protocol/analysis	
<b>Week 12</b>	Project team work on the product. Sensory test protocol development	
<b>Week 13</b>	Project team work on the product. Samples production. Internal panel test	
<b>Week 14</b>	Project team work on the product. Sensory panel evaluation	
<b>Week 15</b>	Project team work on the product. Finalizing product and Sample production for the final presentation	
<b>Week 16</b>	Final presentation/poster & Samples/Industrial visit	

**Textbooks and Reading Material**

**Recommended Books**

1. Francisco, J., Barba, G.C., Farid, C., José, M.L.R., & Paulo, E.S.M. (2020). Design and Optimization of Innovative Food Processing Techniques Assisted by Ultrasound: Developing Healthier and Sustainable Food Products. Academic Press.
  2. Beckley, J.H. 2007. Accelerating new food product design and development. Blackwell Pub. (Softcopy of the book available on request).
  3. Earle, M. & Earle, R. (2007). Case Studies in Food Product Development. Woodhead Publishing Ltd., Abington, Cambridge, UK.
  4. Frewer, L. & Trijp, H. (2007). Understanding Consumers of Food Products. Woodhead Publishing Ltd., Abington, Cambridge, UK.
- Earle, M., Earle, R. & Anderson, A. (2001). Food product development. Woodhead Publishing Ltd., Abington, Cambridge, UK.

### **Teaching Learning Strategies**

1. The structure of this course is different from most of the other courses you have taken. Rather than a lecture course, it is a capstone course that is set up as a guided independent project in which you are expected to demonstrate the ability to integrate and apply the knowledge that you have acquired from previously taken academic courses. Initially you will be divided into teams, which will provide a framework in which you will do your independent product development project. The teams will determine general criteria, with which you will develop your product, allow the division of some general tasks, provide forum for developing ideas and testing them. The teams will introduce their activities to the class in a series of presentations and written reports.
2. Within the team framework, you will do a guided independent product development project. To assure a systematic effort, a structured schedule of reports will be required to provide information on the progress. An individual oral presentation and a written report on the prototype as well as substantial contribution to team's reports are expected. Each team will be required to prepare a term paper (with slides) on an assigned topic related to the new trends in food industry
3. Group and individual guidance are a very important part of this course. It will be provided mainly in the form of class distribution and interpretation of detailed instructions. Various aspects of food product development stages will be discussed in class in a setting similar to industrial management meeting. Continuous interaction between students, the instructor, and the teaching assistant are also a significant part of the course. Students are expected to participate in class discussions and individual conferences. Questions that are general in the nature will be addressed in class. Specific inquires related to the projects will be subject to student/instructor and/or teaching assistant meetings
4. Teams' meetings will include discussions on assigned projects and related matters. Detailed plans will be developed by the teams. Work on individual assignments related to a selected product will include information search and consultations. Detailed plans will be developed by individual students
5. Teaching will be a combination of
  - a) Class lectures,
  - b) Class discussions,
  - c) Group work.

d) Short videos/films will be shown on occasion

### **Assignments: Types and Number with Calendar**

#### **Assignments**

1. Major evaluation will be done for sessional mark by assigning the group project for new product development.
2. The sessional work will also be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

#### **Assessment**

<b>Sr. No.</b>	<b>Elements</b>	<b>Weightage</b>	<b>Details</b>
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.