

**Course Title:** Food Product Development  
**Course Code:** FT-312  
**Resource Person:** Aqsa Akhtar  
**Department:** Food Science and Technology

## **School of Food and Agricultural Sciences (SFAS) Vision**

SFAS endeavors to be a premier center of excellence, offering innovative, high-quality education and professional programs aimed at achieving academic and research excellence, enriching the lives of individuals and making a difference in the world of academia and industry, and to develop a society of professionals, who can contribute towards the betterment of their respective communities.

## **SFAS Mission**

SFAS Mission SFAS provides an intellectually rich, collaborative, research-focused and dedicated learning environment for students, faculty, and staff, while serving the community at various levels. SFAS at UMT has been established with the aim to integrate recent advances in food sciences/technology and agricultural innovations.

## **Program Learning Objectives (PLO's)**

Students graduating with BS Food Science and Technology shall be able to:

1. *Explain the basic principles of food sciences, and its multidisciplinary scope.*
2. *Explain the physical, chemical and biological properties of food and their effects on food safety, and sensory and nutritional quality.*
3. *Apply analytical techniques to characterize composition, and to identify physical, chemical and biological changes in foods.*
4. *Explain the effects of food processing, engineering, preservation, packaging, and storage on food safety and quality.*
5. *Identify the importance of food laws and regulations in ensuring safety and quality of the processed/manufactured foods.*
6. *Conduct applied research and use statistical tools in experimental design and data analysis.*
7. *Apply acquired knowledge to real world situations in food systems, components, production, and processes.*
8. *Apply critical thinking to professional problems.*
9. *Communicate effectively in both oral and written forms.*
10. *Develop organizational, teamwork, and leadership skills.*
11. *Demonstrate professional skills and thoughts of ethical, social integrity, and respect for diversity.*
12. *Demonstrate preparedness for continued reflective practice, and lifelong learning relevant to careers in food sciences.*

## Course Objectives (CLO's)

After the completion of this course, a student will be able to:

1. Learn the techniques required for the new food product development
2. Utilization of the different food ingredients for the new food product development
3. Increase the ability of students to understand food innovation principle
4. Illustration of different analytical techniques for chemical and physical characterization of the newly developed food products
5. Analyzing consumer behavior on the basis of social and cultural beliefs and religious differences in order to accept the newly developed food product

## Learning Objectives

Sr#	Course Learning Objectives	Link with Program Learning Objectives
1.	Learn the techniques required for the new food product development	Students will be easily understanding the different techniques used for the processing and preservation of different food products
2.	Utilization of the different food ingredients for the new food product development	Students are expected to know about the techniques to understand the composition of the different food products and responsible factors which lowers the quality of the beverages.
3.	Increase the ability of students to understand food innovation principle	Students will be able to Identify the importance of food laws and regulations in ensuring the safety and quality of the processed/manufactured foods.
4.	Use different analytical techniques for chemical and physical characterization of the new products	Students will be easily understanding the different techniques used for the processing and preservation of different food products
5.	Analyzing consumer behavior on the basis of social and cultural beliefs and religious differences in order to accept the newly developed food product	Students will easily demonstrate professional skills and thoughts of ethical, social integrity, and respect for diversity

## Course Learning Outcomes

After successful completion of the course work, students have the skills to:

1. Apply a product development process to generate ideas, design, develop and evaluate new products and their markets
2. Demonstrate skill in the application of standard methods for the measurement and evaluation of sensory differences
3. Produce copies of existing food products
4. Apply the principles of quality assurance, food safety and GMP to a food product design
5. Demonstrate an understanding of the functionality of packaging in new product development
6. Demonstrate an understanding of statutory requirements of labelling of food products

## Teaching Methodology

### Interactive classes:

1. Use media to increase student engagement and improve learning outcomes.
2. Try adding metaphors to help students remember details.
3. Give students a real-world context with extra projects to reinforce skills.
4. Provide practical practice within your lessons. Making it relatable will do wonders.

### Case-based teaching:

### Class Participation

Positive, healthy and constructive class participation will be monitored for each class. Particular emphasis will be given to participants during the presentation sessions. How the question is asked or answered will also be noted. Your behaviour, as business executives in the class will contribute to the class participation marks.

### Word of Advice

Assignments/ projects are very demanding and time-consuming. Since you might be exposed to the real corporate environment, the ensuing reality checks could be demoralizing and frustrating. So, you must learn to handle intragroup conflicts and any clash of interests. Unless you start working on the assignments/ projects right away from the very first day you are likely to miss the deadlines.

### Participant Responsibilities:

Students should be responsible enough to practice whatever they have learned during class sessions. They should also implement it to other subjects as well. They are expected to come prepared in the class.

## **Class activities:**

### **Presentations**

After careful analysis, resource person will constitute the groups to achieve balanced heterogeneity among groups, for group assignments/projects and will have the final decision in this regard. Every member of the group is expected to be able to handle all aspects of the assignments. Groups are not allowed to choose presenters for various parts of the presentations; instead, resource person will nominate them. Individuals will be judged for their understanding of the topic through question handling. Q/A section of the presentations will weigh heavily for grading of assignments/ projects.

### **Class Discussions:**

During class, each student will work in a team on discussion questions. Teams will be assigned questions, allowed ten minutes for Internet research, and permitted five minutes to present their results. Points are earned by active participation with your team.

### **Applied Projects:**

This is a practical-based course. Regular attendance is the best predictor of success. Students will perform different practices with detailed instructions, teacher demonstrations, and video tutorials.

**STUDENTS ARE REQUIRED TO READ AND UNDERSTAND ALL ITEMS OUTLINED IN THE PARTICIPANT HANDBOOK**

### **Class Policy:**

#### **Be on Time**

You need to be at class at the assigned time. After minutes past the assigned time, you will be marked absent.

#### **Mobile phone Policy**

**TURN OFF YOUR MOBILE PHONE!** It is unprofessional to be texting or otherwise.

#### **Email Policy**

**READ YOUR EMAILS!** You are responsible if you miss a deadline because you did not read your email. Participants should regularly check their university email accounts regularly and respond accordingly.

## **Class Attendance Policy**

A minimum of 80% attendance is required for a participant to be eligible to sit in the final examination. Being sick and going to weddings are absences and will not be counted as present. You have the opportunity to use 6 absences out of 30 classes. Participants with less than 80% of attendance in a course will be given a grade 'F' (Fail) and will not be allowed to take end-term exams. International students who will be leaving for visas during semester should not use any days off except for visa trips. Otherwise, they could reach short attendance.

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## **Withdraw Policy**

Students may withdraw from a course till the end of the 12th week of the semester. Consequently, grade W will be awarded to the student which shall have no impact on the calculation of the GPA of the student. A student withdrawing after the 12th week shall be automatically awarded an "F" grade which shall count in the GPA.

## **Moodle**

UMT –LMS (Moodle) is an Open-Source Course Management System (CMS), also known as a Learning Management System (LMS). Participants should regularly visit the course website on MOODLE Course Management system and fully benefit from its capabilities. If you are facing any problem using Moodle, visit <http://oit.umt.edu.pk/moodle>. For further query send your queries to [moodle@umt.edu.pk](mailto:moodle@umt.edu.pk).

## **Harassment Policy**

Sexual or any other harassment is prohibited and is constituted as punishable offense. Sexual or any other harassment of any participant will not be tolerated. All actions categorized as sexual or any other harassment when done physically or verbally would also be considered as sexual harassment when done using electronic media such as computers, mobiles, internet, emails etc.

## Use of Unfair Means/Honesty Policy

Any participant found using unfair means or assisting another participant during a class test/quiz, assignments or examination would be liable to disciplinary action.

## Plagiarism Policy

All students are required to attach a “Turn in” report on every assignment, big or small. Any student who attempts to bypass “Turn in” will receive an “F” grade which will count towards the CGPA. The participants submit the plagiarism report to the resource person with every assignment, report, project, thesis, etc. If a student attempts to cheat “Turn in”, he/she will receive a second “F” that will count towards the CGPA. There are special rules on plagiarism for final reports etc. all outlined in your handbook.

## Communication of Results

The results of quizzes, midterms, and assignments are communicated to the participants during the semester and answer books are returned to them. It is the responsibility of the course instructor to keep the participants informed about his/her progress during the semester. The course instructor will inform a participant at least one week before the final examination related to his or her performance in the course.



## Course Outline

**Course code:** FT-312

**Course title:** Food Product Development

<b>Program</b>	BS Food Science and Technology
<b>Credit Hours</b>	3
<b>Duration</b>	16 Weeks
<b>Prerequisites (If any)</b>	Food Processing and Preservation Food Chemistry
<b>Resource Person Name and Email</b>	Aqsa Akhtar <a href="mailto:aqsa.akhtar@umt.edu.pk">aqsa.akhtar@umt.edu.pk</a>
<b>Counseling Timing &amp; Room #</b>	3 hours per week (STD 502)
<b>Contact no.</b>	-
<b>Web Links</b>	-

**Director Programme Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

**Dean's signature** \_\_\_\_\_

**Date** \_\_\_\_\_

## Grade Evaluation Criteria

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

Marks Evaluation	Marks in percentage
Class Presentation	10%
Quizzes	10%
Assignments	10%
Class Project	15%
Lab	15%
Mid-Term	20%
Final exam	20%
<b>Total</b>	<b>100%</b>

## Recommended Text Books:

1. Beckley, J. H., Herzog, L. J., & Foley, M. M. (2017). Accelerating New Food Product Design and Development: Wiley.
2. Fuller, G. W. (2016). New Food Product Development: From Concept to Marketplace, Third Edition: CRC Press.
3. Aramouni, F., & Deschenes, K. (2014). Methods for Developing New Food Products: An Instructional Guide: DEStech Publications, Incorporated.
4. Smith, J., & Charter, E. (2011). Functional Food Product Development: Wiley.
5. Linnemann, A. R., Schroën, C. G. P. H., & van Boekel, M. A. J. S. (2011). Food Product Design: An Integrated Approach: Enfield Pub & Distribution Company.
6. Earle M. and Earle, R. 2008. Case studies in food product development. Woodhead Pub. Ltd. Abington, Cambridge, UK.
7. Frewer, L. and Trijp, H. 2007. Understanding consumers of food products. Woodhead Pub. Ltd. Abington, Cambridge, UK.



**Course: Food Product Development**

**Course code: FT 312**

No	Topics to be covered in the course	Learning Objective of this topic	Expected Outcomes from Students	Teaching Method	Assessment Criteria	Deadlines and Homework
1	Food product development process: strategy, design, development	To describe the food product development process To explain the need for the development of a new food product utilize different techniques involved in the process of new product development	Improve understanding of strategies involved in the development of new food product	Lecture Slides Class Discussion	Class Participation	Within a Week
2	Food product development process: commercialization, launch and evaluation	To describe the food product development process To explain the need for the development of a new food product utilize different techniques involved in the process of new product development	Improve understanding of strategies involved in the development of new food product	Lecture Slides Case Study	Class Participation Case Study	Within a Week
3	Failure and success in new food product development	To learn the key features required for the success of new product To demonstrate the effect of different factors, cause the failure of the product	Learn that key features of new food product success and failure	Lecture Video Tutorial Lab Practical	Class Participation Lab Performance	Within a Week
4	Consumer trends and food choices	To describe the role of the consumer in the success of food product	Improve the understanding regarding the role of	Lecture Literature Review Case Study	Quiz Class Participation	Within a Week

		To learn that how consumer behavior and choices affect the success and failure of the new food product	consumer and food choices in new food product development			
5	Sensory attributes and preferences	To define the sensory analysis of the food To understand the importance of sensory test by the consumer	Familiar with the importance of sensory analysis and utilization of sensory scales for the product evaluation	Lecture Slides Literature Review Practical	Lab Performance Case Study Quiz	Within a Week
6	Trends and new techniques in processing, (example extrusion, sous vide, high pressure, electrical and magnetic fields, light pulses, minimal processing, hurdle technology)	To familiar with the different techniques involved in the new product development	Improve the understanding of food processing and preservation techniques	Lecture Slides Class Discussions	Class Projects Lab Performance	Within a Week
7	Guest Lecture I	TBD				Within a Week
8	<b>Revision &amp; Mid Exams</b>					
9	Food ingredients and their function	To learn the role of ingredients used in food product development To understand the legal requirements for the different food ingredients	Improve the understanding of chemistry of food ingredients	Lecture Slides Class Discussions Literature Review	Class Discussion Lab Activities	Within a Week

10	Designing of different foods for flavour, texture, sweetness and shelf life	To learn different practices and techniques involved in the processing of the different food products	To improve the understanding of the chemistry of the different texture and flavor food products	Lecture Quiz	Whiteboard Test Class Projects Quiz	Within a Week
11	Food product development trials and analysis	To demonstrate the effect of different food trials and analysis on the end quality of the product	To improve the understanding required for the frequent analysis during new food development	Lecture Assignment Lab Practical	Class Projects Lab Performance	Within a Week
12	Skills for replication of established products available from the market place	To familiar the techniques and skills required to prepare replica of the food product through different innovations	To improve the skills among students to understand the composition to produce the same product in terms of quality	Lecture Slides Class Discussions Lab Practical Class Project	Class Projects Lab Performance	Within a Week
13	Guest Lecture II	<b>To Be Decided</b>				Within a Week
14	Student Presentations	To estimate student learning and progress in beverage technology	To develop communication skills and effective communication on industrial floors	Class Participation	Class Presentation	Within a Week
15	Food Product Development Project	To estimate the practical knowledge of the student	To develop practical knowledge among the students required for the research and	Project Presentation and Discussion	Project Presentation	Within a Week

		through lab work and project representation	developments of the new products			
16	Final Examination	Application of all the concepts learned in beverage technology	-	On Campus Examination	Paper and Viva	Within a Week
<b>Result Display</b>						

### Lab Component

During the course students will be able to perform different food product development related projects and practical in the laboratory-based upon the following contents:

- *Food product development projects strategy, design, development, commercialization, launch, and evaluation*
- *Statistical and sensory evaluation techniques*
- *Food analysis: qualitative and quantitative*
- *Food label understanding and manufacturing*



## Course Notes and Comments

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