

School of Food and Agricultural Sciences

Course Title: **Ice cream and Frozen Desserts**

Course Code: **FT-403**

Resource Person: **Dr. Mahwish Tanveer**

Department: **Food Science and Technology**

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 Statement

School of Food and Agricultural Sciences (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

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 Learning Objectives

After studying the course the student shall be able to:

- Learn about the history and development of the ice cream industry
- Classify ice creams into different types on the basis of their characteristics
- Describe the significance of different ingredients in determining physicochemical characteristics of final product
- Use laboratory techniques to analyze and measure important physicochemical parameters of ice creams.
- Learn and understand different technological aspects of ice cream manufacturing
- Familiarize with recent advances in ice cream industry

Learning Objectives:

Sr#	Course Learning Objectives	Link with Program Learning Objectives
1.	Classify ice cream into different types on the basis of their characteristics	Explain the physical, chemical and biological properties of food and their effects on food safety, and sensory and nutritional quality.
2.	Describe the significance of different ingredients in determining physicochemical characteristics of final product	Explain the physical, chemical and biological properties of food and their effects on food safety, and sensory and nutritional quality.
2.	Use laboratory techniques to analyze and measure important physicochemical parameters of ice creams	Apply analytical techniques to characterize composition, and to identify physical, chemical and biological changes in foods.

3.	Learn and understand different technological aspects of ice cream manufacturing	Explain the effects of food processing, engineering, preservation, packaging, and storage on food safety and quality.
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Learning Outcomes

Students will be able to:

- Apply adequate knowledge and understanding about the development of projects related to the production of various types of ice creams.
- Capability to identify the information needed to improve the efficiency of the processes and the quality of the ice creams.

Teaching Methodology

- Lectures
- Presentations
- Video Representations
- Assignments
- Quiz
- Viva voce

Class Participation

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

Participant Responsibilities:

Student should be responsible enough to practice whatever they have learnt 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.

Team 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.

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 10 minutes past the assigned time, you will be marked absent.
- **Mobile 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 emails 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 grade 'F' (Fail) and will not be allowed to take end term exams.
- **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 “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.ugt.edu.pk/moodle>. For further query send your queries to moodle@ugt.edu.pk
- **Harassment Policy**
Sexual or any other harassment is prohibited and is constituted as punishable offence. 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 “Turnitin” report on every assignment, big or small. Any student who attempts to bypass “Turnitin” will receive “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 student attempts to cheat “Turnitin”, 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-403

Course title: Ice cream and frozen desserts

Program	BS FST
Credit Hours	3 Credit Hours
Duration	One Semester
Prerequisites (If any)	
Resource Person Name and Email	Dr. Mahwish Tanveer mahwish.tanveer@umt.edu.pk
Counseling Timing (Room# 502)	Monday (2:00 to 6:00 PM) 502
Contact no.	

Chairman/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
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Mid-Term (Written)	20%
Final exam (Written)	35%
Class Assignment/Project	15%
Quizzes	10%
Lab Exam	20%
Total	100%

Recommended Text Books:

1. Goff, H.D. and R.W. Hartel. 2013. Ice Cream. 7th Edition. Springer New York Heidelberg Dordrecht London.
2. Clarke, C. 2004. The Science of Ice Cream. Published by The Royal Society of Chemistry,

Practicals:

Development of Ice cream, analysis of its chemical composition (protein, ash, carbohydrates), Stabilizers (starch), Measurement of reducing sugars, Physical characteristics of ice cream, Sensory evaluation

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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	<p>Origin and Progress in the development of ice cream and frozen desserts industry.</p> <p>Status of ice cream industry in Pakistan and abroad</p>	<p>Learn about the history and significance of ice cream industry in Pakistan and worldwide</p>	<p>Enlisting names and brands of different ice cream industries in Pakistan</p>	<p>Lecture / Surprise Questions</p>	<p>Question Answer session</p>	<p>Within a Week</p>
2	<p>Definition of ice cream, classification of ice cream, composition of ice cream</p>	<p>Define ice cream and classify it into different types</p>	<p>Defining ice cream and identifying different classes available in the market</p>	<p>Lecture / Surprise Questions.</p>	<p>Discussion Forum Questioning</p>	<p>Within a Week</p>
3	<p>Ingredients in ice cream and frozen desserts: dairy ingredients, emulsifiers, stabilizers, non-dairy ingredients</p>	<p>Understand the role of different ingredients in physicochemical properties of final product</p>	<p>Discussing the effect of different ingredients on final product quality</p>	<p>Lecture / Surprise Questions</p>	<p>Practical Assignment</p>	<p>Within a Week</p>

4	Technological aspects of ice cream manufacture: Preparation of ice cream mix: standardization, blending, homogenization	Learn the technological aspects of ice cream manufacturing	Practically perform the ice cream manufacturing process	Lecture/Assignment/ Discussion forum	Practical Assignment Quiz	Within a Week
5	Technological aspects of ice cream manufacture: Preparation of ice cream mix: pasteurization, cooling, ageing and flavor addition.	Learn the technological aspects of ice cream manufacturing	Practically perform the ice cream manufacturing process	Lecture/Assignment/ Discussion forum/ Quiz	Practical Presentation Quiz	Within a Week
6	Types of ice cream freezers: Batch, Continuous, Soft-serve freezers, homemade freezers. Freezing of ice cream mix	Understand the different types of ice cream freezers and their effect on product quality	Discussing different type of freezers and their effect on ice cream quality	Lecture/Assignment/ Discussion forum	Assignment Discussion Forum questioning	Within a Week
7	Thermodynamics of freezing and refrigeration load: Calculating freezing	Familiarize with thermodynamics of freezing	Calculating freezing point of ice cream mix. Calculating refrigeration load.	Lecture/Assignment/ Discussion forum	Discussion Forum questioning	Within a Week

	point of ice cream mix. Calculating refrigeration load.				Assignment	
8			MID EXAM		MID EXAM	
9	Physico - chemical properties of ice cream mixes and ice cream. Effect of processing on physico-chemical properties.	Learn the effect of different processing conditions on the physico-chemical properties of resultant product	Practically analyzing the effect of processing conditions on physico-chemical properties of resultant product	Lecture/Assignment/Discussion forum	Presentation Quiz	Within a Week
10	Packaging of ice cream and Hardening. Hardening of ice cream – hardening methods, Storage and Shipment of ice cream	Importance and type of appropriate packaging material and effect of storage conditions on product	Identify the type of packaging material used for ice cream and its significance	Lecture/Discussion forum	Discussion Forum Questioning Assignment	Within a Week
11	Sensory Attributes of Ice cream and frozen desserts.	Familiarize with different factors affecting the sensory acceptability of product	Performing sensory analysis of different type of ice creams	Lecture/Assignment/Discussion forum	Discussion Forum Questioning	Within a Week

	Method of Sensory Evaluation of Ice Cream.				Assignment	
12	Defects in Ice cream: flavor, body & texture, color and appearance, package and melting quality	Identifying the defects in ice creams	Identifying different defects by sensory evaluation	Lecture/Quiz/Assignment	Discussion Forum Questioning Quiz	Within a Week
13	Technology of dried ice cream mix and Nutritive value of ice cream. Dried ice cream mix: composition, uses. Nutritive value	Understand the nutritional significance and composition of dried ice cream mix.	Enquiring about nutritional significance and composition of dried ice cream mix.	Lecture/Assignment/Discussion forum	Discussion Forum Questioning Quiz Presentation	Within a Week
14	Hygiene, cleaning and sanitation of ice cream plant. personnel, equipment and plant hygiene, cleaning and sanitization of ice cream freezers and related equipment	Significance of adapting hygienic practices in ice cream industry for the implementation of effective food safety system	Identify different key areas where hygienic measures are mandatory for ensuring product safety	Lecture/Assignment/Discussion forum	Discussion Forum Questioning Presentation	Within a Week



University of Management and Technology



15	Recent advances in ice cream industry and plant management: Low-calorie, reduced fat, diabetic and dietetic ice cream and frozen desserts.	Learn about the recent advances in ice cream industry	Enlisting different modified products available in the market such as low-calorie, reduced fat, diabetic and dietetic ice cream and frozen desserts.	Lecture/Assignment/ Discussion forum	Presentation Quiz	Within a Week
16	Final Exam					



