Lahore University of Management Sciences

SCI 232 – Introduction to Food Science

Summer 2021

Instructor	Dr. Muhammad Saeed
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Office Hours	Will be announced later
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Secretary/TA	
TA Office Hours	
Course URL (if any)	

Course Teaching Methodology (Please mention following details in plain text)

- Teaching Methodology: A blend of both synchronous and asynchronous lecture. In case of obligatory online teaching live lecture will be delivered via Zoom followed by sharing of the recording link with students for off-line access.
- Lecture details: I will prefer in-class lectures; however, if online teaching is mandatory due to COVID-19 induced lockdown, 100% lectures will be recorded and available for off-line access.

Course Basics				
Credit Hours	**03**			
Lecture(s)	Nbr of Lec(s) Per Week	**05**	Duration	**110 min each**
Recitation (per week)	Nbr of Rec (s) Per Week		Duration	
Lab (if any) per week	Nbr of Session(s) Per Week		Duration	
Tutorial (per week)	Nbr of Tut(s) Per Week		Duration	

Course Distribution	
Core	
Elective	elective
Open for Student Category	SBASSE, MGSHSS, SAHSOL, SOE, SDSB
Closed for Student Category	

COURSE DESCRIPTION

IN the current era of modern technologies and social media, a surge of fake news and misconceptions about food, health, diseases, and other important areas of human life is quite prevalent. Even an educated person can inadvertently fall victim to fake news propaganda if s/he does not have sufficient scientific knowledge. In this multidisciplinary course, students will learn fundamental sciences and modern technologies that will not only equip them against any unscientific myth, but also will ensure the safe and secure supply of food to consumers. Students will also apply fundamental and integrated concepts of engineering, biological and physical sciences to understand the nature of food, causes of food deterioration, principles underlying food processing, and improvement of food. This course is designed for everyone who is involved in any domestic and commercial aspect of food such as production, preparation, cooking, processing, handling, and of course consumption.

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COURSE PREREQUISITE	
•	None, a prior basic school-level knowledge of chemistry, biology, and physics will help to perform better in this course but is not required.

COURSE OBJECTIVES	
•	• To provide scientific knowledge on the composition and constituents Food Materials • To provide scientific knowledge on the skills used in food safety, processing, quality assurance, analysis, and new product development • To enhance the technical qualification of students interested in establishing career in the Food Industry

Learning Outcomes	
•	At the end of this course, the students should be able to: • Describe the constituents and composition of major foods including, cereals, grains, fruits and vegetables, meat, poultry, eggs, milk and dairy products, and confectionary products. • Understand the scientific and functional properties of main food constituents including carbohydrates, proteins, fats, vitamins, colors, and flavors. • Explain the basic principles of food processing operations (heating, cooling, drying, preserving etc). • Explain how animal products such as meat, eggs, and dairy products are preserved. • Describe the type of microorganisms found in food, the factors that affect their growth, and their role in food spoilage and food fermentation. • Explain the nature of food additives, food preservatives, and food laws and regulation.

Grading Breakup and Policy

Attendance:	5%
Class Participation:	15% (asking questions and voluntarily answering the question or initiating/participating in a discussion)
Assignments/homework:	15 % (~2-3)
Quizzes:	15 % (~5-6)
Mid-term exam/write up:	20 %
Final exam:	30 %

Instructor has the privilege to change the grading scheme, which, if availed, will be conveyed to the students well in time.

Examination Detail	
Midterm Exam	Yes/No: Yes Combine/Separate: Duration: 180 min Preferred Date: Around the middle of the semester Exam Specifications: Closed books, Course material in any form is not permitted
Final Exam	Yes/No: Yes Combine/Separate: Duration: 180 min Exam Specifications: Closed books, Course material in any form is not permitted

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COURSE OVERVIEW			
Lectures	**Topics**	**Recommended Readings**	**Objectives/ Application**
Lecture 1	Introduction to Food Science: Food Patterns, health impact, determinants of palatability, judging food	Lecture notes and supplied text/material, Chapter 1	Student should be able to describe food behavior (nutritional need, health issues), aesthetic appeal of food presentation, and evaluation of food quality.
Lecture 2	Nutrition and Food: achieving good nutrients, cultural accent, retaining nutrients in food	Lecture notes and supplied text/material, Chapter 2	Students should be able to describe the essential nutrients in food, functions associated with key nutrients, and guidelines for achieving good nutrition.
Lecture 3	Food Safety: Potential microorganisms in foods, Food-borne illness, source and control of microorganisms	Lecture notes and supplied text/material, Chapter 3	Students should be able to explain food-borne illness and microorganism-based food poisoning, and their control by using high standards of hygiene.
Lecture 4	Factors in Food Preparation: Basic preparation and cooking equipment, safety in kitchen, temperature in food preparation	Lecture notes and supplied text/material, Chapter 4	Students should be able to explain the role of temperature (from freezing to boiling/frying) in the used preparation of food and heat transfer by conduction, convection, and radiation.
Lecture 5	Vegetable: Aspects of Palatability, Nutrient content, harvesting, marketing, and storage, factors in vegetable cookery	Lecture notes and supplied text/material, Chapter 5	Students should be able to explain the scientific rationale in the procuring and retaining essential nutrients while preparing vegetable-based food.
Lecture 6	Fruits: Nutritional aspects of fresh, dried, canned, and frozen fruits	Lecture notes and supplied text/material, Chapter 6	Students should be able to describe the nutritional values of fresh and preserved fruits.
Lecture 7	Salads and Salad Dressings: nutritional perspective, types of salads, principles of preparation	Lecture notes and supplied text/material, Chapter 7	Students should be able to describe the nutritional aspects of different types of salads and dressings.
Lecture 8	Fats and Oils: Types of fats and oils, controversial ingredients, technological handling of fats	Lecture notes and supplied text/material, Chapter 8	Students should be able to describe very basic chemistry and functionality of edible oils and fats.
Lecture 9	Carbohydrates: types of sugars in the Marketplace, Sweetening power, reactions of sugars	Lecture notes and supplied text/material, Chapter 9	Students should be able to describe mono- and disaccharides that are available in variety of food products.
MidTerm Exam			
Lecture 10	Carbohydrates: Starches and Cereals: polysaccharides, starch in food preparation, nutritional aspects of wheat, corn, rice, barley	Lecture notes and supplied text/material, Chapter 10	Students should be able to describe the physical and chemical changes occurring during preparation of food consisting of starches and cereals.
Lecture 11	Proteins: Eggs, nutritional value, structure and changes, products from eggs-omelets, custards, cream puddings/pies, Meringues, Souffles, foam cakes	Lecture notes and supplied text/material, Chapter 11	Students should be able to describe the nutritional aspects of eggs, egg products, handling and storage conditions.

Lecture 12	Proteins: Meats, Poultry, and Fish	Lecture notes and supplied text/material, Chapter 12	Students should be able to define meat, describe its nutritional aspects, inspection and grading of meats and selection of meat cookery.
Lecture 13	Leavening Agents:-air, steam, carbon dioxide, and biological agents	Lecture notes and supplied text/material, Chapter 13	Students should be able to describe different technique of leavening in baked products.
Lecture 14	Breads:-Muffins, Biscuits, Cake doughnuts, waffles and pancakes, yeast breads	Lecture notes and supplied text/material, Chapter 14	Students should be able to describe different types of breads and scientific reasons behind their texture, taste, and appearance.
Lecture 15	Basics of Batters and Doughs	Lecture notes and supplied text/material, Chapter 15	Students should be able to describe different types of batters and doughs.
Lecture 16	Cakes, Cookies, and Pastries	Lecture notes and supplied text/material, Chapter 16	Students should be able to describe different types of cakes, cookies, and pastries and scientific reasons behind their texture, taste, and appearance.
Lecture 17	Beverages:-Coffee, tea, cocoa and chocolate, fruit beverages	Lecture notes and supplied text/material, Chapter 16	Students should be able to describe different types of beverages and scientific reasons behind their texture, taste, and appearance.
Lecture 18	Persevering Food:-canning, freezing, preserving with sugar and salt, drying	Lecture notes and supplied text/material, Chapter 17	Students should be able to describe different methods of preserving food and their scientific rational.
Final Exam			

Textbook(s)/Supplementary Readings

Food Fundamentals, Margaret McWilliams, 10th edition, Pearson Education Limited, 2014 UK