جامعة الشرقية
A' SHARQIYAH UNIVERSITY

Course Descriptor
FSHN F411 Food Chemistry

Proposed Academic Year	2021-2022	**Last Reviewed Academic Year**	2020- 2021
Course Code	FSHN F411	**Course Title**	Food Chemistry
Credit Hours	3 (2+1)	**Level of Study**	Bachelor of Science
College/Centre	CAHS	**Department**	FSHN
Co-requisites		**Pre-requisites**	FSHN N101, CHEM 101, CHEM 102

1. COURSE OUTLINE

The course applies basic scientific principles to food systems and practical applications. Chemical/biochemical reactions of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods are discussed with respect to food quality. Reaction conditions and processes that affect color, flavor, texture, nutrition, and safety of food are emphasized. Students are given a role in the learning experience through group discussions and independent projects related to real world problems associated with the food industry

2. AIMS

On successful completion of the course, the students will be able to

(a) Understand food chemistry in terms, issues, research and relevance to the food industry.
(b) Identify the functional properties of foods and food molecules
(c) Relate specific chemical interactions to specific food systems
(d) Describe how food processing, handling, and storage alter food quality
(e) Differentiate among factors influencing food chemistry and food quality
(f) Read and apply current literature on food chemistry topics
(g) Synthesis and convey (written and/or oral) food chemistry topics.

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3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS (Indicative)

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
1. Able to describe the general chemical structures of the major components of foods (water, proteins, carbohydrates, and lipids) and selected minor components	Lectures, presentations and experiments	quizzes and written examination
2. Students will be able to predict how processing conditions are likely to change the reactivity of food components.	Lectures, presentations and experiments	Quizzes and written examination
3. Students will be able to give a molecular rationalization for the observed physical properties and reactivity of major food components.	Lectures, presentations and experiments	quizzes, and written examination
5. Students will be able to predict how changes in overall composition are likely to change the reactivity of individual food components	Lectures, presentations and experiments	Quizzes and written examination

6. Students will be able, through critical evaluation, to determine approaches that may be used to control the reactivity of those food components that are likely to impact the overall quality of finished products.	Lectures, presentations and experiments	Quizzes and written examination

4. ASSESSMENT WEIGHTING (Theory+ Lab)

Assessment	Percentage of final mark (%)
Theory	
Quizzes	20
Assignments	10
Mid-Term Exam	25
Final Exam	45
TOTAL	**100**
Laboratory	
Quizzes	10
Lab Report	20
Mid-term Exam	30
Final Examination	40
TOTAL	**100**

Note: The percentage of the final marks is distributed as below:
Theory course: **70%**
Lab course: **30%**

5. COURSE CONTENT (Indicative)

WEEK	LECTURE TOPIC
1.	Orientation and Introduction to Food Chemistry, Registration/Add and Drop
2.	Water: Properties, functions, water activity, effect on shelf life of food, role in food preservation
3.	Carbohydrates: Classification, structure, nomenclature
4.	Carbohydrates: properties - physical, chemical, Caramelization, Maillard reaction, dietary fiber
5.	Proteins: Classification, structure, amino acids, physical, chemical
6.	Proteins: Functional properties, spoilage, modification
7.	**Midterm Exam**
8.	Lipids: Classification, structure, fatty acids, properties, emulsifiers, rancidity
9.	Lipids: Functional properties, spoilage, modification
10.	Colours: Natural colors, artificial colours, pigments – properties, functions, stability.

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5. COURSE CONTENT (Indicative)	
WEEK	**LECTURE TOPIC**
11.	Minerals: Major mineral elements, trace elements, stability, chemical and functional properties.
12.	Flavours: Characteristics - taste, odor, astringency, off-flavor.
13.	Vitamins: Classification, properties and stability
14.	Enzymes: nature, functions, classification
15.	Revision
16.	
	TOTAL HOURS
1 - 15	Plus **RECOMMENDED INDEPENDENT STUDY HOURS**
	TOTAL COURSE HOURS

Note: One Laboratory experiment will be performed every week. The experiments will be related with the theory taught in that related week depending on the availability of materials needed for that experiment. The details are mentioned in Laboratory Manual.

6. RECOMMENDED READING

- DeMan, J.M. 2007. Principles of food chemistry. Springer Verlag, Heidelberg, Germany.
- Lecture Notes & Presentation material will be provided by the Instructor.
- Laboratory Manual
- Library + online resources:

7. REFERENCE BOOKS

- Damodaran, S., Parkin, K.L. and Fennema, O.R. 2008. Fennema‘s food chemistry. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.
- Belitz, H.D, Groschm, W. and Schieberle, P. 2004. Food chemistry. Springer Verlag, Heidelberg, Germany.

Library + online resources:

Open Educational Resources