

Course Syllabus

1	Course title	Advanced Food Chemistry
2	Course number	(0603721)
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	
5	Program title	Food Science and Technology
6	Program code	037
7	Awarding institution	The University of Jordan
8	School	Agriculture
9	Department	Nutrition and food Technology
10	Level of course	master
11	Year of study and semester (s)	2019/2020
12	Final Qualification	MSc
13	Other department (s) involved in teaching the course	-
14	Language of Instruction	English
15	Date of production/revision	1/3/2020

16. Course Coordinator: Prof. Khalid Al-Ismail

Office numbers, office hours, phone numbers, and email addresses should be listed.

036, 11-12 Sunday and Monday, kh.ismail@ju.edu.jo

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

As stated in the approved study plan.

This course deals with the physical and chemical properties of water and its influence on the microbial and chemical deterioration. The functional properties of proteins and their interaction with carbohydrates and fats, the changes that occur in fats and oil during processing and storage and their effect on food quality and structure, physicochemical properties, method of extraction and purification that affect the stability of natural colors and pigments.

19. Course aims and outcomes:

A- Aims:

- 1- To identify the chemical structure of food components including fats, proteins, colors, flavors and enzymes.
2. To understand the chemical changes that take place with food components during processing and storage such lipid oxidation
3. Recognize the functional properties of proteins and fat and their function in food products

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to

A-Knowledge and Understanding

- A1-** understand the chemical structure and properties of water, proteins, lipids, enzymes, natural pigments and food flavor.
A2- understand the chemical reactions of the major food components during processing and storage and how these reactions affect the quality of food.
A3- Describe the basic functional properties of protein, lipid in food
A4. Describe the mechanisms for formation of specific flavor during processing
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And so, on

B- Intellectual Analytical and Cognitive Skills

- B1-** Explain the mechanisms responsible for the modification or formation of compounds during processing
B2- Explain the role of protein in formation of emulsions, foams and gels
B3- reading and using literature and communicate the obtained knowledge in writing
B4- Use the theoretical knowledge to solve problems related occur during processing and storage to food
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And so, on

C- Subject Specific Skills

- C1-** Gain the basic principles to avoid lipid deterioration in foods
C2- Applicable for solve the problems that affect the quality of foods during processing and storage
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And so, on

D- Transferable Key Skills

- D1-** Gain the basic knowledge to be applied in production of food products
D2- Suggest which specific analytical methods that are relevant for describing chemical changes of food quality.
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And so, on

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Water Structure of water and ice, physical properties of water and ice, water activity and relative vapour pressure, moisture sorption isotherms, relative humidity and microbial and chemical deterioration of foods	(1 st & 2 nd)	Prof. Khalid Al-Ismail	A1, C2, D1	Exam, Quizzes, assignment	Ref 1, ch.2
Lipids Fat deterioration: thermal oxidation, photoxidation, lipolysis, effect of fats and oils on the quality and structure of food during storage and processing, chemical changes during frying, antioxidants and prooxidants. Role of fat in some food products	(3 rd , 4 th , 5 th & 6 th)	Prof. Khalid Al-Ismail	A1, A2, B1, C1, D1	Exam, Quizzes, assignment	Ref 1, ch. 5
Proteins Structure and functional properties of protein hydration, solubility, interfacial properties, flavor binding, gelation, and dough formation; processing induced physical, chemical and nutritional changes in proteins; protein interaction with carbohydrates and fats.	(6 th , 7 th , 8 th & 9 th wk)	Prof. Khalid Al-Ismail	A1, A2, A3, A3, A4, B2, B3, B4, , C2, D1, D2	Exam, Quizzes, assignment	Ref 1, ch. 6
Mid Term Exam		Prof. Khalid Al-Ismail			
Enzymes Definition, Enzymes cofactors Enzymes nomenclature, Enzymes specificity,	(9 th , 10 th , &11 th wk)	Prof. Khalid Al-Ismail	A1, B2, B3, B4, C2, D1, D2	Exam, Quizzes, assignment	Ref 1, ch. 7

Factors affect enzymes activity, Enzymes immobilization Some food modification enzymes					
Natural pigments: Definition, classification, structure, physiochemical properties, methods of extraction and purification, factors that affect the stability of natural pigments	(12 th , & 14 th wk)	Prof. Khalid Al-Ismail	A1, A2, B4, C2, D1	Exam, Quizzes, assignment	Ref 1, ch. 10
Natural Flavor Definition, vegetable, fruits and spice flavors, flavor from lactic acid-ethanol fermentation, flavor volatiles from fats and oils, flavor volatiles in muscle and milk, extraction, purification and analysis of flavor, factors that affect the stability of natural flavors.	(15 th & 16 th wk)	Prof. Khalid Al-Ismail	A1, A4, D1, D2	Exam, Quizzes, assignment	Ref 1, ch. 11

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

ILO/s	Learning Method
A. Knowledge and Understanding (A1-A..)	Lectures and Discussions, Homework
B. Intellectual Analytical and Cognitive Skills (B1-B..)	Lectures and Discussions, Homework
C. Subject Specific Skills (C1-C....)	Lectures and Discussions, Homework
D. Transferable Key Skills (D1-D3...)	Lectures and Discussions, Homework

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

ILO/s	Evaluation Method
A. Knowledge and Understanding (A1-A..)	Exam, Quiz, assignments, ..
B. Intellectual Analytical and Cognitive Skills (B1-B..)	Exam, Quiz, assignments, ..
C. Subject Specific Skills (C1-C....)	Exam, Quiz, assignments, ..
D. Transferable Key Skills (D1-D3...)	Exam, Quiz, assignments

23. Course Policies:

Students and instructors each have an important role in maintaining a classroom environment optimal for learning, and are expected to treat each other with respect during class, using thoughtful dialogue, and keeping disruptive behaviors to a minimum. Class discussions are interactive and diverse opinions will be shared; please be thoughtful in sharing your perspectives and responses with one another. Other behaviors that can be disruptive are chatting and whispering during class, the use of electronic equipment, preparing to leave before class is over, and consistently arriving late to class. Please keep these disruptions to a minimum. Inappropriate behavior in the classroom may result in a request to leave the class and/or subject to penalty.

24. Required equipment: (Facilities, Tools, Labs, Training....)

- Classroom facilities
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25. References:

Required book (s), assigned reading and audio-visuals:

Text book:

- 1- Fenema, O. (editor) 1996. Food Chemistry 4rd ed. Marcel Dekker, New York, USA
- 2- Deman, J.M., 1999. Principle of Food Chemistry, 3rd edition, Aspen Publication Inc, Gaithersburg, Maryland, USA.

Recommended books, materials, and media:

26. Additional information:

Name of Course Coordinator: Prof.Khalid Al-Ismail Signature: ----- Date: 1/3/2020

Head of curriculum committee/Department: Prof.Khalid Al-Ismail Signature Signature: -----

Head of Department: Prof Maher Al-Dabass Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

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