1	**Course title**	Processing of Fats and Oils
2	**Course number**	(633445)
3	**Credit hours (theory, practical)**	1 theory, 1 practical
	Contact hours (theory, practical)	1 theory, 3 practical
4	**Prerequisites/corequisites**	Food chemistry (0603321)
5	**Program title**	Food Science and Technology
6	**Program code**	042
7	**Awarding institution**	The University of Jordan
8	**School**	Agriculture
9	**Department**	Nutrition and Food Technology
10	**Level of course**	Fourth year
11	**Year of study and semester (s)**	2019/2020, first semester
12	**Final Qualification**	Bachelor
13	**Other department (s) involved in teaching the course**	-
14	**Language of Instruction**	English
15	**Date of production/revision**	1/9/2019

16. Course Coordinator:

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

22411, 12-1 Sunday, Tuesday, 065355000-22411, 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.
Sources, composition and properties of edible fats and oils and their effects on the quality of fat - based foods; technologies of fat processing such as extraction, refining, hydrogenation, winterization; production of fat products such as margarine, ghee, salad oil as well as some non-food products based on fat; quality control tests for the various oils and fats.

19. Course aims and outcomes:

A- Aims:
1- To comprehend the physicochemical characteristics of fats and oils, and their processing and utilization for food purposes.
2- To provide the students with an advanced understanding of the sources and industrial processing of edible fats and oils.
3- To understand autoxidation of unsaturated fatty acids and lipolysis during food processing and storage,
4-Recognize the functionality roles of fats in fat-based foods.

Intended Learning Outcomes (ILOs):

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding: Student is expected to
A1- Understand the basic chemical structure of different fatty acids, triglycerides, sterols,
A2- Understand the chemical and physical properties of fats and oils

A3- To provide the students with an advanced understanding of fat deterioration
A4- Learn about the extraction, refining and modification of edible oils
A5- Describe the various processes used in the production of some fat products

B. Intellectual Analytical and Cognitive Skills: Student is expected to
B1- Explain how chemical structure influences the physical nature of oils and fats, which in turn relates to their properties in food products
B2- Find out how to prevent oxidation and rancidity in oils and fats
B3-Identify the various principles used to determines fat content, physiochemical properties, fat oxidation level.
B4- Explain the factors that affect the quality of fat during extraction, refining and production
C. Subject- Specific Skills: Students is expected to
C1- Be able to write concise laboratory report
C2- Be able to acquire skills and abilities to conduct fats and oils analysis
C3- Be able to prepare several fat- based products
C4- list types of rancidity and how it is accelerated and prevented and relates to food quality.

D. Transferable Key Skills: Students is expected to
D1- work in group
D2- Be able to use library and internet pertaining to fats and oils
D3- summarize various processes used in producing fats for the consumer.

20. Topic Outline and Schedule:
-Theoretical Part

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Review of the chemical structure of fats and oils	1 (1nd, wk)	Prof , Khalid al-Ismail	A1, B1		1&2
Physical and chemical properties of fats and oils	2 (2nd & 3rd wk)	Prof , Khalid al-Ismail	A2, B1, C1, , D2		1
Classification of fats and oils +Sources of edible fats and oils	1 (5th wk)		A2, B1, C1, , D2		1&2

Fat Deterioration (Lipolysis and autoxidation)	1 (4thwk)		A3, B2, B3, C4, C2		1&2
Fats and oils extraction: mechanical and solvent extraction and rendering	3 (6th, 7^{th,} & 8th wk)		A4, B4, C1, C2, D1, D2		1
Refining of crude oils and fats: degumming, free fatty acid removing, bleaching, and deodorization	3 (9th, 10^{th,} &11^{th,} wk)		A4, B4, C4		1
Fractionation of fats and oils: dry fractionation, solvent fractionation	2 (12th, &13th wk)	Prof , Khalid al-Ismail	A1, A4, B4, C1, C2, , D2, D3		1
Deep fat frying: chemical and physical changes of frying medium, factors affecting frying process	1 (14th wk)	Prof , Khalid al-Ismail	A3, B2,B4, C1, C4, D1, D2		1&2
Production of margarine and shortening	2 (15th, &16th wk)	Prof , Khalid al-Ismail	A3, , B4, C3, C2		1

-Practical Part

Lab. NO	Topic
1	Refractive index, specific gravity and melting point of fats and oils
2	Smoke, flash and fire points of some crude and refined oils
3	Tests for fats and olive oils adulteration and detection of antioxidants in oils
4	Total polar compounds in frying oils
5	Cholesterol and phytosterols in edible fats and oils
6	Degumming and alkali refining of crude oils, soap in oil and FFA content
8	Bleaching of the alkali refined oils
9	Winterization of oils
10	Kirschner, Polonsky and Reichert-Meissl values
11	Production of animal and milk fat
12	Visit to an olive oil press
13	Visit to a crude oils processing company

21. Teaching Methods and Assignments:

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

-Power point
-Homework
-Oral question

22. Evaluation Methods and Course Requirements:

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

Activity   Mark
1-Mid term exam   30
2- Quizes   10
3-Report   10
6-Final exam   50

QF-AQAC-03.02.1.2

23. Course Policies:

A

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 behaviour 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
Tools such as picnometers, Refractometer,

25. References:

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

Text book:
1- Frank. Gunstone, (2002). Vegetable Oils in Food Technology: Composition, Properties and Uses, Blackwell Publishing

1- Deman, J.M., 1999. Principle of Food Chemistry, 3rd edition, Aspen Publication Inc, Gaithersburg, Maryland, USA

26. Additional information:

Name of Course Coordinator: Prof. Khalid Al-Ismail   Signature: ------------------ Date: 9/12/2019

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

Head of Department: --- Signature: ----------------------

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

Dean: --- -Signature: ---