

Course Syllabus

1	Course title	Advanced Laboratory Techniques in Food and Nutrition
2	Course number	603781
3	Credit hours (theory, practical)	2 practical
	Contact hours (theory, practical)	6 practical
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 degree
11	Year of study and semester (s)	Second semester, 2019/2020
12	Final Qualification	Master Degree
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	5/3/2020

16. Course Coordinator: Prof. Khalid Al-Ismail

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

037

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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.

The course deals with the study of advanced chemical and biochemical laboratory techniques used in research as applied in nutrition and food science. A special emphasis is placed on the different chromatographic techniques, use of isotopes, spectrophotometry and electrophoresis.

19. Course aims and outcomes:

<p>A- Aims:</p> <p>1- To be familiar with food sampling for analysis</p> <p>2- To gain a basic understanding of the chemistry and physical factors involved in chemical separations.</p> <p>3- To become proficient in the use of chromatography for the quantitative analysis of compounds in food</p> <p>4- To become familiar with the basic concepts of qualitative analysis of food samples using IR, NMR, and mass spectrometry</p> <p>5- To understand Transportation, handling, processing, record keeping, results, interpretation of results</p> <p>B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to</p>
<p>A-Knowledge and Understanding</p> <p>A1- list the general principles in food analysis</p> <p>A2- Understand the principles behinds the analytical techniques</p> <p>A3- know the way of reporting results</p>
<p>B- Intellectual Analytical and Cognitive Skills</p> <p>B1- Apply statistical principles for data evaluation</p> <p>B2- Identify the techniques used to determines food components such as vitamins sugars..etc.</p> <p>B3- Identify the reasons of food components analysis</p>
<p>C- Subject Specific Skills</p> <p>C1- Be able to write concise laboratory report</p> <p>C2- Be able to acquire skills and abilities to conduct instrumental analysis of some macro and micronutrients analysis</p> <p>C3- Know methods of selecting the appropriate analytical techniques for a specific food component</p>
<p>D- Transferable Key Skills</p> <p>D1- work in group</p> <p>D2- Be able to use library and internet pertaining to food analysis</p>

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Sampling: Sampling plane and statistical techniques in validation of instrumental analysis.	1 th week	Prof. Khalid Al-Ismail	A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1
Visible-spectrophotometry: Determination of enzymatic activity in milk and other food products	2 ^{ed} week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Ultraviolet-	3 ^{ed} week		A2, A3, B1,	Exam, Quizzes,	1&2

spectrophotometry: Determination of tyrosine and tryptophane in different food products.			C1, C2, D1, D2	assignment	
Flame photometry: Determination of Ca, Na, K in milk and other foods.	4 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Atomic absorption spectroscopy: Determination of heavy metals, Ca and Mg in milk	5 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Fluorometry: Determination of vitamin C in food.	6 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Column chromatography: Separation and quantification of some natural pigments in food.	7 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Gas liquid chromatography: Determination of fatty acids in oils and fats.	8 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
HPLC: Determination of water soluble and fat-soluble vitamins.	9 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Ion-exchange chromatography: Analysis of amino acids	10 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Electrophoresis: Whey protein electrophoretic mobility study.	11 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Gel permeation	12 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1&2
Enzymatic analysis: Determination of cholesterol in blood and food.	13 th week		A2, A3, B1, C1, C2, D1, D2	Exam, Quizzes, assignment	1

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, assignment - laboratory work
B. Intellectual Analytical and Cognitive Skills (B1-B..)	Lectures and Discussions, assignment - laboratory work
C. Subject Specific Skills (C1-C....)	Lectures and Discussions, assignment - laboratory work
D. Transferable Key Skills (D1-D3...)	Lectures and Discussions, assignment - laboratory work

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, Quizzes, assignment, lab reports
B. Intellectual Analytical and Cognitive Skills (B1-B..)	Exam, Quizzes, assignment, lab reports
C. Subject Specific Skills (C1-C....)	Exam, Quizzes, assignment, lab reports
D. Transferable Key Skills (D1-D3...)	Exam, Quizzes, assignment, lab reports

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,...)

HPLC, GLC, UV/VIS-spectrophotometer, ELISA and other equipments

25. References:

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

- 1-Nielsen,S S (editor). Food analysis, 2nd edition, Aspen Publication INC, USA. (1998),
- 2-Principles of Instrumental Analysis

Recommended books, materials, and media:

26. Additional information:

Name of Course Coordinator: Prof. Khalid Al-Ismail Signature: ----- Date: -----

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

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

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

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