1	**Course title**	Dairy Chemistry and Microbiology
2	**Course number**	0643446
3	**Credit hours (theory, practical)**	3
	Contact hours (theory, practical)	1
4	**Prerequisites/corequisites**	Non
5	**Program title**	BSc. Food Science and Technology
6	**Program code**	042
7	**Awarding institution**	The university of Jordan
8	**School**	Agriculture
9	**Department**	Food Science and Nutrient
10	**Level of course**	BSc, under graduate
11	**Year of study and semester (s)**	First semester 2020-2021
12	**Final Qualification**	Grade based
13	**Other department (s) involved in teaching the course**	Non
14	**Language of Instruction**	English
15	**Date of production/revision**	Each year

16. Course Coordinator:

Name: Malik Hadaddin
Office number: 160-Ground Floor
Phone number: 0795245862
Email: m.haddadin@ju.edu.jo

17. Other instructors:

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

18. Course Description:

Milk protein, and milk coagulation; flavor development of dairy products; milk lipids deterioration; functional prosperities of milk components; milk fermentation chemistry, taxonomy and identification of milk microflora; bacteriophage, physiology and growth; genetic engineering of lactic acid bacteria.

19. Course aims and outcomes:

A- Aims:

1- Outline significance of dairy chemistry and microbiology.
2- Understanding and practice specified chemical and microbiological testing of milk and dairy products.
3- Recognizing microbial and chemical hazards resulted during processing and technology of dairy products.
4- Understanding the underlying chemical reactions involved during processing of dairy products.
5- Practicing processing and aspects of different dairy products.

A. Knowledge and Understanding: Student is expected to

A1- Identify dairy chemical and microbial principles of the most importance of dairy products.

A2- Recognize important chemical and microbial factors affecting dairy products quality and safety.

A3- In case study of technological aspects for different dairy product.

A4- Understand chemical and microbiological factors that affect quality of the dairy products.

A5- Understand and practise processing steps involved in different dairy products.

A6- Conduct specified chemical and microbiological testing for dairy and related understanding their principles.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1-Learn how to control chemical and microbiological characteristics of dairy products.

B2- How to benefit from different aspect of dairy products in food industry.

B3- How to deal with different dairy products infected by different chemical and microbiological reactions.

C. Subject-Specific Skills: Student is expected to

C1- Identify chemical and microbiological methods control and preserve quality and safety of dairy products.

C2- Identify microbial flora and chemical composition importance to selected dairy products.

C3- In case study of different dairy products and quality and safety aspects.

C4- Differentiate between good (processing) and bad (spoilage and pathogenic) dairy related microorganisms.

D. Transferable Key Skills: Students is expected to
D1- Acquire skills needed in dairy laboratory for chemical and microbiological testing relevant to dairy quality and safety.

20. Topic Outline and Schedule

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction for Dairy chemistry and microbiology.	1	Dr. Malik Hadaddin	A1-A2	Quiz + exam + assignment	Robinson and Moss. 2002
Milk quality and safety issue	1	Dr. Malik Hadaddin	A1-A3	Quiz + exam + assignment	Robinson and Moss. 2002
Milk quality and safety issue	2	Dr. Malik Hadaddin	A3-A4	Quiz + exam + assignment	Conto et al., 2018.
Milk quality and safety issue	2	Dr. Malik Hadaddin	A2-A4	Quiz + exam + assignment	Conto et al., 2018.
Butter chemistry and microbiology	3	Dr. Malik Hadaddin	A3-A4	Quiz + exam + assignment	Conto et al., 2018.
Butter chemistry and microbiology	3	Dr. Malik Hadaddin	A4-A5	Quiz + exam + assignment	Conto et al., 2018.
Quiz 1					
Cheese chemistry and microbiology	4	Dr. Malik Hadaddin	C2-C3	Quiz + exam + assignment	Robinson and Moss. 2002
Cheese chemistry and microbiology	5	Dr. Malik Hadaddin	C1-C3	Quiz + exam + assignment	Robinson and Moss. 2002
Cheese chemistry and microbiology	5	Dr. Malik Hadaddin	C1-C3	Quiz + exam + assignment	Robinson and Moss. 2002
Midterm exam	6				
Acidified milk products chemistry and microbiology	6	Dr. Malik Hadaddin	A3-A4	Quiz + exam + assignment	Nout. and Sarkar, 2016
Acidified milk products chemistry and microbiology	7	Dr. Malik Hadaddin	A5-A6	Quiz + exam + assignment	Nout. and Sarkar, 2016
Acidified milk products chemistry and microbiology	7	Dr. Malik Hadaddin	A3-A4, C1-C4	Quiz + exam + assignment	Fuquay et al., 2011

Acidified milk chemistry and microbiology	8	Dr. Malik Hadaddin	A3-A4, C2-C3	Quiz + exam + assignment	Fuquay et al., 2011
Theory midterm	8	Dr. Malik Hadaddin	A1-A4, C1-C3	Quiz + exam + assignment	Fuquay et al., 2011
Long life product chemistry and microbiology	9	Dr. Malik Hadaddin	A1-A4, C2-C3	Quiz + exam + assignment	Nout. and Sarkar, 2016
Long life product chemistry and microbiology	9	Dr. Malik Hadaddin	A3-A4, C1-C3	Quiz + exam + assignment	Nout. and Sarkar, 2016
Long life product chemistry and microbiology	10	Dr. Malik Hadaddin	A3-A4, C2-C3	Quiz + exam + assignment	Nout. and Sarkar, 2016
Microbiology of selected commodities	10	Dr. Malik Hadaddin	C2-C3	Quiz + exam + assignment	--
Microbiology of selected commodities	11	Dr. Malik Hadaddin	C2-C3	Quiz + exam + assignment	--
Food fermentations and introduction to dairy biotechnology	11	Dr. Malik Hadaddin	C1-C3	Quiz + exam + assignment	--
Food fermentations and introduction to dairy biotechnology	12	Dr. Malik Hadaddin	C1-C3	Quiz + exam + assignment	--
Quiz 2	12	Dr. Malik Hadaddin	C1-C3	Quiz + exam + assignment	--

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
Evaluation methods include: Homework, Quiz, Exam, pre-lab quiz…etc.

ILO/s	**Learning Method**
A. Knowledge and Understanding (A1-A..)	Quiz + exam + assignment
B. Intellectual Analytical and Cognitive Skills (B1-B..)	Quiz + exam + assignment
C. Subject Specific Skills (C1-C….)	Quiz + exam + assignment
D. Transferable Key Skills (D1-D3…)	Quiz + exam + assignment

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..)	Quiz + exam + assignment
B. Intellectual Analytical and Cognitive Skills (B1-B..)	Quiz + exam + assignment
C. Subject Specific Skills (C1-C….)	Quiz + exam + assignment
D. Transferable Key Skills (D1-D3…)	Quiz + exam + assignment

23. Course Policies:

A- Attendance policies:
In case if the absence exceeded 15%, the student will automatically will fail the course.

B- Absences from exams and handing in assignments on time:
Makeup exam will be assigned. Postponing the assignment delivery time could not be provided.

C- Health and safety procedures:
Are instructed from the beginning of the course.

D- Honesty policy regarding cheating, plagiarism, misbehaviour:
Withdrawal of the exam

E- Grading policy:

It is given to the students from the beginning of the course.

F- Available university services that support achievement in the course:
Labs are well equipped for this purpose.

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

Dairy laboratory equipment.

25. References:

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

1- Adams, M. R. and Moss, M. O. 2004. Food Microbiology. The Royal Society of Chemistry, Cambridge.

2- Nout, M.J.R. and Sarkar, P. K. 2016. Fermented Milk and dairy products. CRC Press. Taylor & Francis Group, NW.

3- Spreer, E. 1998. Milk and Dairy Products Technology. Marcel Dekker Inc. NY

Recommended books, materials, and media:

1- Center for Food Safety & Applied Nutrition (2001). Bacteriological Analytical Manual Online U.S. Food & Drug Administration, U. S. Department of Health and Human Services. (http://www.cfsan.fda.gov/~ebam/bam-toc.html).

2- Jay J.M., Loessner, M. J. and Golden, D. V. 2005. Modern Food Microbiology. 7th edition Springer, New York.

Ray, B and Bhunia, A. 2008. Fundamental Food Microbiology. 4th edition. CRC Press. Taylor & Francis Group, NW.

26. Additional information:

Non

Name of Course Coordinator: ------- Dr. Malik Hadaddin --Signature: ---------- Date: 11th Oct 2020

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

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

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

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