



Course Specifications

Course Title:	Dairy Technology
Course Code:	2064203-3
Program:	Bachelor in Food Science and Nutrition
Department:	Food Sciences and Nutrition Department
College:	College of Science
Institution:	Taif University

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A. Course Identification

1. Credit hours: 3 Hours
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 12 th Level / 4 th year
4. Pre-requisites for this course (if any): Food Preservation (2063201-3)
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	20
3	Tutorial	--
4	Others (specify)	--
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

This course deals with the definition of milk and various dairy products- Traditional and modern manufacturing methods of various dairy products (soft cheese, hard cheese semi hard cheese, cream, butter, ghee, ice cream, yoghurt...etc)- Application of quality assurance standards and safety of milk and dairy products during manufacturing, transportation, handling and storage

2. Course Main Objective

- 1) Identify the functional characteristics of milk ingredients and their role in the manufacture of dairy products
- 2) Show the traditional and modern technological processes involved in the production and storage of various dairy products (cheese - fermented dairy products - fatty products - byproducts of dairy factories - dried and condensed milk – Ultrafiltration -- reverse osmosis).
- 3) Application of quality assurance standards and safety of milk and its products during manufacturing processes, transport, handling, and storage.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and understanding	
1.1	Define the physical, chemical and nutritional properties of milk and milk products	K3
1.2	Outline the different methods of milk treatments (heat-evaporation-condensation- drying).	K3
1.3	Describe the methods and mechanism of manufacturing the different milk products	K3
2	Skills:	
2.1	Judge the raw milk and other ingredients involved in manufacturing different dairy products.	S4

CLOs		Aligned PLOs
2.2	Apply the industrial processes of different dairy products.	S4
2.3	Evaluate the changes in milk resulting from different processing methods and predict the products quality.	S1
3	Values:	
3.1	Further the trust and good relationships with other colleague.	V3
3.2	Support both oral and written excellence for data presentation.	V3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction: - Definition and general properties of milk. - Identification of the raw materials in dairy industry. - Functional characteristics of milk ingredients and their relation to the manufacture of dairy products.	3
2	Cheese Industry: - Economic and nutritional importance of cheese - Starters in dairy industry- activation-production.	3
3	Cheese Industry (Continued): - Classification of cheese - Acid and enzyme coagulation of milk - Different procedures of cheese manufacturing	6
4	Cheese ripening and the changes in lactose, proteins, and fats during ripening.	3
5	Milk fat properties: - Butter manufacturing Procedures-Ghee manufacturing procedures Factors controlling the properties of cream, butter and ghee - Chemical composition of cream, butter and ghee.	3
6	Milk fat substituents: Types and applications of Milk fat substituents	3
7	Fermented Milk. - Industry of fermented milk products. - Starters applied in manufacturing of fermented milk products.	3
8	Ice cream- Frozen yoghurt	3
9	Liquid and dry milk: Heat treatments and processing of milk: Pasteurized milk-Sterilized milk-UHT milk-Condensed milk-Evaporated milk-Dried milk	3
Total		30
Experimental Topics		
1	Milk composition-milk sampling- Sensory, physical, chemical and microbiological properties of milk - Bacteriological tests of milk.	2
2	Preparation of starters.	2
3	Cheese Industry: * Modification of milk composition- Types of milk coagulation. * Hard cheese industry: - Ras cheese - Emental cheese * Semi hard cheese: - Edam Cheese-Gouda cheese * Soft cheese: - Double cream cheese - White cheese- Domiati cheese.	4
4	*Processed cheese (production and evaluation)	2
5	* Cream industry: - Separation- whipping – heating-substitute cream	2
6	* Butter and Ghee industry	2
7	* Fermented Milk industry.	2
8	Ice cream- Frozen yoghurt * Evaluation of dairy products	2
9	Liquid and dry milk Heat treatments and processing of milk – dried milk	2
Total		20

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding		
1.1	Define the physical, chemical and nutritional properties of milk and milk products	- Lecture.	- Written exam
1.2	Outline the different methods of milk treatments (heat-evaporation-condensation- drying).	- Lecture - Practical demonstrations	- Written exam - Practical exam
1.3	Describe the methods and mechanism of manufacturing the different milk products	- Lecture	- Written exam
2.0	Skills		
2.1	Judge the raw milk and other ingredients involved in manufacturing different dairy products.	- Write a short search	- Written exam - Report evaluation
2.2	Apply the industrial processes of different dairy products.	- Lecture - Practical demonstrations	- Written exam - Practical exam
2.3	Explain the changes in milk resulting from different processing methods and predict the products quality.	- Practical demonstrations	- Practical exam
3.0	Values		
3.1	Further the trust and good relationships with other colleague.	- Practical lessons	- Practical exam
3.2	Visit the scientific websites and Library for research the modern issues of dairy science.	- Divide into small groups	- Group Presentation

2. Assessment Tasks for Students:

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignment and Interaction during lectures	Continues	10%
2	Midterm exam	5-6	20%
3	Weekly Lab. Reports	Continues	20%
4	Practical exam	11	10%
5	Final exam	12	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support:

Arrangements for availability of faculty and teaching staff for individual student consultations and academic:

- There are 6 h per week for this purpose and the students know these hours according to the time of professor who teach the course.
- Student satisfaction surveys are conducted for academic guidance.
- Develop an improvement plan for academic guidance based on the results of the questionnaire analysis.

F. Learning Resources and Facilities:

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> - Applied dairy microbiology. Marth, E. H. and Steele, J. L. (2001). Marcel Dekker, Inc - Patrick Fox Paul Mc Sweeney Timothy Cogan Timothy Guinee (2004) Cheese: Chemistry, Physics and Microbiology 3rd Edition. Major Cheese Groups. Elsevier applied science publishers, New York, USA.
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Essential References Materials	- Richardson, G.H. (1985). Standard methods for the examination of dairy products. 15 th ed. American public health association, Washington, D.C.
Electronic Materials	- Journal of Dairy Science - Journal of food science - https://www.who.int/foodsafety/areas_work/food-standard/en/ - International food standards (FAO/WHO Codex Alimentarius). - https://www.iso.org
Other Learning Materials	- None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Classroom (capacity not more than 40 students) for 3 h/week. - Microbial Lab (capacity not more than 20 students) for 3 h/week
Technology Resources (AV, data show, Smart Board, software, etc.)	- Data Show projectors, smart blackboard. - Computer Portable PowerPoint presentations to special lectures.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	- Data Show projectors, smart blackboard. - Computer Portable PowerPoint presentations to special lectures.

G. Course Quality Evaluation:

Evaluation Areas/Issues	Evaluators	Evaluation Methods
- Effectiveness of teaching and assessment	- Students, faculty, program leaders and Peer Reviewer	- Continuous monitoring by directors of program and quality assurance unit (Direct). - Applying Questionnaires received from the Deanship of Academic Development for Student evaluation (indirect). - Evaluation of course report (indirect).
- Extent of achievement of course learning outcomes	- Students, faculty, program leaders and Peer Reviewer	- Applying Questionnaires for Student evaluation (indirect). - Evaluation of course report (indirect).
- Quality of learning resources	- Faculty, program leaders, administrative staff, independent reviewers.	- Continuous monitoring by directors of program and quality assurance unit (Direct). - Applying Questionnaires for Student evaluation (indirect). - Evaluation of course report (indirect).

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department council - Academic Development Committee	
Reference No.	Department council NO: 5	Subject NO: 2
Date	08 /07 /1444 H	