



Jordan University of Science and Technology
Faculty of Agriculture
Nutrition & Food Technology Department

NF479 Dairy Products Technology
Second Semester 2023-2024

Course Catalog
3 Credit Hours. Milk collection. Study of dairy industry processes including pasteurization, homogenization, separation technology, and packaging. Introduction to dairy product manufacturing including liquid milk, yogurt, labaneh, cheese, and other milk products. Cleaning of dairy plants
Teaching Method: On Campus

Text Book	
Title	Dairy Microbiology Handbook
Author(s)	- Robison, k. R.
Edition	3rd Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Advanced Dairy Science and Technology	Britz, J. T. and Robison, k. R	2nd Edition	
3	Food Chemistry	Belitz, H.D., Grosch, W., Schieberle, P.	4th Edition	

Instructor	
Name	Dr. Sana Gammoh
Office Location	C4 level 3
Office Hours	
Email	sigammoh4@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 13:00 - 14:00 Room: CH2107

Prerequisites		
Line Number	Course Name	Prerequisite Type
633750	NF375 Food Technology	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	MILK PRODUCTS PROCESSES	
Weeks 3, 4, 5	THERMAL PROCESSING OF MILK	
Weeks 6, 7, 8, 9	MARKET MILKS	
Weeks 10, 11, 12	DAIRY PRODUCT MANUFACTURING	
Weeks 13, 14	SAFETY AND QUALITY OF DAIRY PRODUCTS	
Weeks 15, 16	APPLACATION OF PROCESS CONTROL - MANAGEMENT TOOLS	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
1) Learn about the various stages involved in the process of converting milk into consumable products including every step in the process from milk reception to storage and distribution (milk production from animal to market).	8%	
2) Learn about the milk collection including milking machines, farm bulk milk tanks and storage and transport of raw milk, and type of bacteria that may present in each.	8%	
3) Learn about the classification of processes group to enhance milks utilization and safety including fractionation such as centrifugal separation, membrane separation, ion exchange, precipitation and crystallization, filtration and homogenization, concentration such as evaporation, freeze concentration, membrane separation, drying and centrifugal separation, and preservation such as pasteurization, thermalization, and sterilization, chilling and freezing, reduction of pH, dehydration, salting and packaging	8%	
4) Learn about the utilization of processes to manufacture products from milk such as fluid milk products, fermented milk products, milk powder products, casein products, milk fat (cream) products and whey products.	8%	

5) Learn about the changes to milk components during processing such as the effect of heating on destruction of bacteria, inactivation of enzymes, distraction of some vitamins, denaturation of whey proteins, shift of soluble salts to the colloidal phase, dephosphorylation of casein, maillard reaction, isomerization and degradation of lactose, changes to fat globule membrane and pH decrease, effect of evaporation on concentration of milk solids, increase of colloidal salts, increase in micelle size, decrease in pH and limited denaturation of whey proteins, effect of homogenization on the increase in number of fat globule, adsorption of casein on fat globules, decrease of fat globule size and decrease in protein solubility, and effect of spray drying on rapid removal of water and relatively minor changes in protein.	8%	
6) Learn about the heat treatment, where a number of heat-induced transformations of milk components determine the functional properties of the final product such as biological safety, shelf-life, flavour, taste and texture. Fresh milk, cheese, milk powder and fermentation products such as yoghurt all require a different heat treatment, i.e. a specific temperature? time history.	8%	
7) Learn about the the basic heat treatments in the dairy industry are thermization for inactivation of psychotropic microorganisms, low pasteurization for inactivation of pathogenic microorganisms, high pasteurization for inactivation of all microorganisms but not spores and sterilization and UHT (ultra-hightemperature) treatment to destroy spores. The effect of the heat treatment on the final product quality depends on the combination of temperature and time applied; this determines the equipment selection.	8%	
8) Learn about the fouling of equipment by deposit formation on walls as a result of heat treatment is governed by specific reactions of milk components. These typical undesired reactions reduce the heat transfer coefficient, increase the pressure drop over heat treatment equipment, and increase product losses, resulting in higher operating costs.	8%	
9) Learn about the Reaction engineering approach applicable to the optimal design and operation of dairy heat-treatment equipment.	8%	
10) Learn about the impact of heating on the product properties, classification of the heat-induced (bio)-chemical reactions in milk, effect of the temperature-time history quantified, classification of heating processes and advanced heating systems such as Extended shelf-life (ESL) milk and innovative steam injection (ISI) approach.	8%	
11) Learn about the production lines of fluid market milk (pasteurized, UHT), cream, butter, ice cream, fermented products and cheese.	8%	
Learn about the three classes of contamination represent hazards in milk, include biological hazards, such as bacteria, fungi and other microbial pathogens, chemical hazards such as residues of medication in the lactating animal, pesticides and a variety of industrial and environmental contaminants that might contaminate the feed of the lactating animal and finally land in the milk, and physical hazards such as discarded hypodermic needles, fragments of metal or glass and any other foreign object that may have found its way into the milk products, e.g. hair, feed particles, somatic cells, etc.	6%	
13) Learn about the Application and implementation of the seven HACCP system principles and its prerequisite programs GMP in dairies plant and demonstrating this on ground in a dairy plant through answering a questionnaire concerning the implementation of HACCP system in food Company and accordingly submitting an evaluation report.	6%	

Relationship to Program Student Outcomes (Out of 100%)				
SLO1	SLO2	SLO3	SLO4	SLO5

Evaluation	
Assessment Tool	Weight
first hour exam	20%
Final exam	40%
Internal lab final exam	10%
Internal lab reports	10%
second hour exam	20%

Policy	
Attendance	Consistent with Jordan University of Science and Technology guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time. No make-up exams will be given for unexcused absences.
Withdraw	Consistent with Jordan University of Science and Technology guidelines.

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