



Course Specifications

Course Title:	Food Preservation
Course Code:	2063201-3
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: 8 th Level / 3 th year
4. Pre-requisites for this course (if any): Fundamentals of Food Industries (2062102-3)
5. Co-requisites for this course (if any): Food Microbiology (2062204-3)

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	6 hr/Week	100%
2	Blended	---	---
3	E-learning	---	---
4	Distance learning	---	---
5	Other	---	---

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	---
4	Others (specify)	---
	Total	60

B. Course Objectives and Learning Outcomes:

1. Course Description This course deals with studying the principles of food preservation- Mechanisms of reduction of the declined nutritional quality properties- Different aspects of post harvesting processes of raw and fresh products and their derivatives- Preparation of raw material for preservation- Assessment of the preserved food quality- Food preservation by (heat treatment- radiation- salting- concentration- smoking- canning- preservatives- fermentations)- Effect of different preservation procedures on the physical and chemical properties of foods.
2. Course Main Objective: 1) Recognize the importance, methods and factors affecting food preservation. 2) Outline the different effects of preservation on the nutritional value of food.

3. Course Learning Outcomes:

CLOs		Aligned PLOs
1.0	Knowledge and understanding	
1.1	Recognize the importance and factors affecting food preservation.	K3
1.2	Define the effects of preservation on the properties and nutritional value of preserved foods.	K4
2.0	Skills:	
2.1	Explore the role of preservation in overcome of food spoilage and foodborne microorganisms.	S3
2.2	Predict the properties of the final products and the changes resulting from preservation.	S4
2.3	Demonstrate the product faults arising from inefficient preservation and their applicable solutions to overcome product faults	S5
3.0	Values:	
3.1	Cooperation with others during achieve the practical tasks.	V 1
3.2	Expresses a judgment about the obtained experimental data.	V 3

C. Course Content:

No	List of Topics	Contact Hours
1	Introduction to the basics, definitions of food preservation technology; basic principles of food preservation and its importance.	3
2	Factors responsible for food spoilage and their control - classification of food preservation methods - Raw material preparation for preservation.	3
3	Food preservation by low temperature: - Refrigeration (Requirements of refrigerated storage- Refrigeration systems - Changes in food during refrigerated storage). - Freezing (Factors determining freezing rate - Changes during freezing - Methods and systems of freezing - Freezing disadvantages and artifacts).	6
4	Food preservation by high temperature: (Pasteurization – Sterilization – Canning - Concentration – Condensation)	6
5	Food preservation by dehydration (Effect of food properties on dehydration - Change in Food during drying - Drying methods and equipment).	6
6	Traditional food preservation methods (Salting – pickling - smoking).	3
7	Non-traditional food preservation technologies: (Irradiation - High-pressure treatment - Ohmic heating - Infrared (IR) heating - Dielectric (microwave) heating).	3
Total		30
Practical Topics		
1	Revision on the preparation of food solutions and methods of measuring the concentration - Density, moisture and water activity measurements.	3
2	Preparation of vegetables and fruits for conservation and different ways of preserving food.	3
3	Practical applications for preserving food using low temperature – Cooling (Chilling).	3
4	Practical applications for preserving food using low temperature – Freezing.	3
5	Practical applications for preserving food using high temperature – Canning.	3
6	Practical applications for preserving food using high temperature – Concentration and Condensation - Concentration of tomatoes into tomato paste, and preparation of ketchup.	3
7	Practical applications for preserving food using moisture control – Dehydration of selected vegetables and fruits - Calculations for drying preservation - Tests on dried foods.	3
8	Practical applications for the Preservation of food by salting, pickling and smoking.	3
9	Practical applications for the Manufacturing and preservation of (Juice - Concentrated fruit juice - fruit syrup - manufacture of carbonated water)	3
10	Practical applications for the preparation of (Jam).	3
Total		30

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	Recognize the importance and factors affecting food preservation.	- Lecturer - Practical	- Written and practical exams
1.2	Define the effects of preservation on the properties and nutritional value of preserved foods.	- Lecturer - Practical	- Written and practical exams
2.0	Skills		
2.1	Explore the role of preservation in overcome of food spoilage and foodborne microorganisms.	- Practical - Brain storming	- Practice exam - Evaluation of assignments
2.2	Predict the properties of the final products and the changes resulting from preservation.	- Practical - Brain storming	- Practice exam - Evaluation of assignments
2.3	Demonstrate the product faults arising from inefficient preservation and their applicable solutions to overcome product faults	- Practical - Brain storming	- Practice exam - Evaluation of assignments
3.0	Values		
3.1	Cooperation with others to achieve the practical tasks.	- Practical	- Lab exercise
3.2	Expresses a judgment about the obtained experimental data.	- Practical study	- Lab reports

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 advice:

- 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.
- Staff are available for individual student consultation during Social media, WhatsApp, Blackboard.

F. Learning Resources and Facilities

1. Learning Resources:

Required Textbooks	<ul style="list-style-type: none"> - Aylward F. (1999). Frozen Food Technology - Processing and Laboratory Control. Published by Allied Scientific Publishers, Bikaner, India. 303 pages. - Heldman D. (2011): Food Preservation Process Design, 1st Edition - Academic Press; 1st edition - February 24, 2011- ISBN- 10: 0123724864 - 368 pages. - Robert Shewfelt R., S. Prussia and S. Taylor (2012): Postharvest Handling, 1st Edition: A Systems Approach. Academic Press - ISBN-10: 0126399905 - 358 pages
Essential References Materials	<p>- سعد أحمد سعد حلابو وعادل زكي محمد بديع و محمود على أحمد بخيت. تكنولوجيا الصناعات الغذائية (أسس حفظ وتصنيع الأغذية). المكتبة الأكاديمية. 2008.</p> <ul style="list-style-type: none"> - Journal of Food Sciences - Journal of Food Protection and Preservation.
Electronic Materials	<ul style="list-style-type: none"> - Wikipedia - Sciencedirect.com - Springer - Wiley - PubMed. - Blackboard lectures.
Other Learning Materials	- None

2. Facilities Required:

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> - Classroom (capacity not more than 60 students) for 3 h/week (must be equipped with data show facility). - Laboratory (capacity not more than 20 students) for 3 h/week (must be equipped with data show and all Lab. facility)
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - Data Show projectors, smart blackboard. - Microwave ovens, Pasteurization unit, chemical - preservatives, Kitchen machine, Thermometers, Freezers, Refrigerators, gas cookers and all other equipment to be used in laboratory food preservation

G. Course Quality Evaluation:

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Applying Questionnaires for Student evaluation (indirect). • Evaluation of course report (indirect).
Quality of learning resources	Faculty, program leaders, administrative staff, independent reviewers.	<ul style="list-style-type: none"> • 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: 2	Subject NO: 1
Date	30 /02 /1444 H	