



Course Specification

(Bachelor)

Course Title: Food Inspection Technologies

Course Code: APFQ3114

Program: Intermediate Diploma in Food Quality and Safety

Department: Clinical Nutrition

College: Applied Medical Sciences

Institution: Umm Al-Qura University

Version: 3

Last Revision Date: 21 Mar 2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

- A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others
- B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 3/Year2)

4. Course General Description:

This course will discuss the technologies used to track and manage food safety activities more efficiently by exploring various digitalized forms of food safety, quality assurance, or sanitation inspection.

5. Pre-requirements for this course (if any):

N/A

6. Co-requisites for this course (if any):

N/A

7. Course Main Objective(s):

This course aims to prepare the student with knowledge and skills to use up to date technologies used in food inspection activities in different settings, and to enhance his/her ability to search, critique, and select new technology in the future.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
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1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	State the technologies used to track and manage food safety activities	K3	Lecture	Exams
1.2	Distinguish up-to-date technologies in food inspection	K2	Assignment and discussion	Assignments
2.0	Skills			
2.1	Evaluate the validity and reliability of inspection instruments and tools	S2	Lecture Videos	Exam
2.2	Apply different inspection technologies in different settings	S3	Brainstorming sessions	Group project
3.0	Values, autonomy, and responsibility			
3.1	Continuous self-development with having good morals and Islamic teachings	V2	Assignment and discussion	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Course overview, assessment, and resources History of Food Inspection Technology and Importance	2



2.	Lecture terminology Thermometry: Bimetal Thermometer, Infrared Thermometer, Thermocouple Thermometer.	2
3.	Lecture terminology Metal Detection systems	2
4.	Lecture terminology Food X-Ray Detection & Inspection Systems and Equipment	2
5.	Lecture terminology Dynamic Checkweigher Systems	2
6.	Midterm exam + Lecture terminology Software solutions designed for data reporting and analysis	2
7.	Lecture terminology Foreign Object Detection Systems for Retailer Food Safety Requirements	2
8.	Lecture terminology Food Microbiology Testing	2
9.	Lecture terminology Food Analytical Testing; Beverage Testing	2
10.	Lecture terminology Food Authenticity and Profiling	2
11.	Non-Destructive Testing Techniques: Lecture terminology Near-Infrared Spectroscopy (NIR) Hyperspectral Imaging X-ray Imaging and Computed Tomography (CT) for foreign object detection	2
12.	Sensory Evaluation Techniques Lecture terminology Importance of sensory evaluation in food quality control Methods for sensory testing (taste panels, consumer testing) Role of sensory analysis in food inspection	2
13.	Automated Assessment of Food Quality and Safety Emerging Technologies in Food Inspection <ul style="list-style-type: none"> • Overview of cutting-edge technologies (AI, machine learning) • Use of drones and robotics in food inspection • Case studies on innovative inspection technologies 	2
14.	Food Traceability and Tracking Technologies Lecture terminology Examine tools like RFID tags, barcodes, and blockchain for tracking food products through the supply chain. Review successful traceability systems in practice and their impact on food safety.	2
15.	Global Perspectives on Food Inspection	2
Total		30



No	List of practical topics	Contact Hours
1	Lab safety and guidelines	2
2	Practical thermometry: Bimetal Thermometer	2
3	Practical thermometry: Infrared Thermometer	2
4	Practical thermometry: Thermocouple Thermometer	2
5	Practical metal detection systems	2
6	Practical food X-Ray Detection & Inspection Systems and Equipment	2
7	Apply dynamic Checkweigher Systems; Automated Assessment of Food Quality and Safety	4
8	Apply software solutions designed for data reporting and analysis	2
9	Apply foreign Object Detection Systems for Retailer Food Safety Requirements	2
10	Apply Modern Food Microbiology Testing	4
11	Apply Food Analytical Testing; measuring pH levels in food products	2
12	Apply Food Analytical Testing; Beverage Testing	2
13	Modern Food Authenticity and Profiling	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam	6 th week	30%
2.	Assignments and group activities	All term	20%
3.	Final exam	16 th	50%
	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Chen, Q., Lin, H., & Zhao, J. (2021). <i>Advanced nondestructive detection technologies in food</i> (pp. 23-58). Singapore:Springer.
Supportive References	Rahman, M. S. A., Mukhopadhyay, S. C., & Yu, P. L. (2014). <i>Novel sensors for food inspection: Modelling, fabrication and experimentation</i> (pp. 11-13). Basel, Switzerland:Springer International Publishing. Cho, Y. J., & Kang, S. (Eds.). (2011). <i>Emerging technologies for food quality and food safety evaluation</i> . CRC press
Electronic Materials	Canadian Food Inspection Agency https://inspection.canada.ca/eng/1297964599443/1297965645317 FSIS:



	https://www.fsis.usda.gov/inspection/compliance-guidance/new-technology ThermoFisher Scientific, A Practical Guide to Metal Detection and X-ray Inspection of Food: https://www.thermofisher.com/sa/en/home/global/forms/industrial/metal-detector-ebook-registration-form.html
Other Learning Materials	Questionnaires https://www.fsis.usda.gov/inspection/compliance-guidance/food-safety-assessments-tools

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, laboratories
Technology equipment (projector, smart board, software)	Blackboard collaborating, data show, Smart Board, internet access
Other equipment (depending on the nature of the specialty)	laboratory equipment

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, faculty, program leaders and peer reviewer	<ul style="list-style-type: none"> Continuous monitoring by directors of program and quality assurance unit (Direct)
Effectiveness of Students assessment	Students, faculty, program leaders and peer reviewer	<ul style="list-style-type: none"> Applying questionnaires received from the Deanship of Academic Development for student evaluation (Indirect) Evaluation of course report (Indirect)
Quality of learning resources	Program leaders and peer reviewer	<ul style="list-style-type: none"> Continuous monitoring by directors of program and quality assurance unit (Direct) Applying questionnaires for student evaluation (Indirect)
The extent to which CLOs have been achieved	Students, faculty, program leaders and peer reviewer	<ul style="list-style-type: none"> Applying questionnaires for



Assessment Areas/Issues	Assessor	Assessment Methods
		student evaluation (Indirect) Evaluation of course report (Indirect)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Umm Al-Qura University Council
REFERENCE NO.	851141114462/190392
DATE	22/11/1446

