

Course description template for Research Methodology 2

Course Name .1					
Research Methodology 2/PhD					
Course Code .2					
Ag.Co.726					
Term/Stage/Year .3					
Spring semester / PhD program 2025-2026					
Date this description was prepared .4					
2026/2/1					
Available attendance formats .5					
In-person + Combined					
Number of study hours (total) / Number of units (total) .6					
Theory / 2.5 Units 2					
Name of the course coordinator (if there is more than one, mention it) .7					
أ.م.د. حنان وليد قاسم hanan_aqwaan@uomosul.edu.iq					
Course Objectives .8					
			Theoretical Enabling the student to understand and comprehend everything related to the scientific research methodology, methods of conducting scientific research and reaching conclusions In addition to methods of writing and publishing high quality scientific research		
Teaching and learning strategies .9					
			Theoretical components -Interactive lectures -Brainstorming -Dialogue and discussion -Assigning reports -Conducting monthly and daily exams		
Course Structure .10					
طريقة التقييم	طريقة التعلم	اسم الوحدة او الموضوع	مخرجات التعلم المطلوبة	الساعات	الأسبوع
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theoretical. The meaning of scientific research.	Theoretical: a1 The student learns the meaning of scientific research	Theory2	1
Short quizzes,	Theoretical Auditory methods Writing on the board	Theory The importance of scientific research	Theory a1 The student	Theory 2	2

homework assignments, discussions	Direct dialogue method		learns about the importance of scientific research.		
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Providing robust solutions to specific scientific problems facing society	Theory A1 The student learns about scientific prediction, proactive knowledge, and analysis of problems and their variables. This can only happen through researchers following correct scientific methods and approaches.	Theory 2	3
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theoretical. Scientific research requirements	Theoretical 2: The student learns requirements for good scientific research	Theory 2	4
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory scientific research hypotheses	Theory The student learns about the hypotheses of scientific research, which preliminary expectations set at the beginning of the study, are based on prior knowledge or initial evidence about the subject being studied. These hypotheses serve as provisional answers or expected conclusions from the researcher about the relationship	Theory 2	5

			ween certain iables, and the earcher aims to test m by collecting and analyzing data		
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue meth	Theory Scientific research methodology	Theory A2. The student learn about scientific resear methodology. It is th general framework a approach that the researcher relies on organize and guide t research process. It is a set of rules and meth used to collect, analy and interpret data i order to answer th research question or hypotheses. Researc methodology provid the systematic steps t ensure the accuracy a reliability of the resu	Theory 2	6
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue meth	Theory Levels of Scientific Research and Element a Scientific Research P	Theory a2 The student will le about two basic levels scientific research: The theoretical level a the applied level.	Theory 2	7
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue meth	Theory The problem of scientific research	Theory A2. The student learns about the mo important problems scientific research. T is one of the essentia stages that those preparing a scientifi research plan must pay attention to. Choosing the resear problem is not easy; requires careful	Theory 2	8

			examination and study of all its dimensions. Then, the researcher formulates hypotheses that represent initial solutions to the problem. After that, the remaining parts of the research are explored by utilizing previous studies and gathering evidence that revolves around proving the validity or invalidity of the hypotheses, in a precise system according to the scientific research methodology.		
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory Defining the scientific research problem	Theory a1 The student learns that the researcher can identify the problem of his study by reviewing previous studies that were conducted on the same topic of his research. Reviewing previous studies will raise some questions for the researcher that lead to identifying the research problem.	theory 2	9
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory Characteristics of a good scientific research problem	Theory a2. The student will learn the most important methods To state the problem concisely and briefly possible, explaining the	Theory 2	10

			problem clearly and stating the research problem.		
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory Research Ethics	Theory A2. The student learns about the most important ethics of scientific research. These are a set of values and principles that researchers follow when conducting their studies. Ethics encompasses all aspects of research from data collection to the publication of results, and aims to achieve a balance between scientific creativity and responsibility towards individuals and society.	Theory 2	11
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory Ethics of animal treatment in laboratory science experiments	Theory b1: The student distinguishes the ethics of dealing with animals in laboratory scientific experiments.	Theory 2	12
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory The need to justify the use of animals and the legal and regulatory aspects	Theory A1. The student identifies the influencing factors and the necessity of justifying the use of animals and the legal and regulatory aspects.	Theory 2	13
Short quizzes, homework	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory Special Ethics Committees	Theory a1 The student identifies the factors influencing the	Theory 2	14

assignments, discussions		On the Ethics of Dealing with Experimental Animals	spread of ethics committees related to the ethics of handling laboratory animals		
Short quizzes, homework assignments, discussions	Theoretical Auditory methods Writing on the board Direct dialogue method	Theory A field visit to several laboratories to observe the work of researchers and whether they are following the correct methods in conducting laboratory experiments, and to submit a report on the student observations during the aforementioned visit	Theory C1 The student writes a report about the field visit	Theory 2	15

Course Evaluation 11				
% Relative weight	Degree	Calendar date (week)	Assessment methods	ت
2.5	2.5	Week 4	Report 1	1
2.5	2.5	Week 5	Report 2	2
2	2	Week 6	(1) Short Quiz	3
2	2	Week Fourteen	(2) Short Quiz	4
1	1	Week fifteen	(3) Short Quiz	5
7.5	7.5	Week 6	(1) Midterm exam	6
7.5	7.5	Week Eleven	(2) Midterm exam	7
40	40	Final exams	Final theory test	8
5	5	Week fifteen	Final theory test	9
2	2	Weeks three and five	Field assessment	10
1	1	Week 1	Short practical test (1) Quiz	11
0.5	0.5	Week 4	Short practical test (2) Quiz	12

1	1	Week Fourteen	(3) Short practical test	13
5.5	5.5	weeks 13و12و11و10و9و8و6	Live drawings and homework	14
20	20	Final exams	Final exam	15
%100	%100	100	the total	

استاذة النظري: أ.م.د. حنان وليد قاسم

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رئيس قسم علوم الاغذية: أ.م.د. طه محمد تقى

رئيس اللجنة العلمية: أ.م.د. طه محمد تقى



Handwritten signature of Dr. Taha Mohamed Taky, followed by a blue ink stamp that reads 'الاستاذ المساعد الدكتور' (Associate Professor Dr.) and 'طه محمد تقى' (Taha Mohamed Taky).

Course Description (PhD): Packaging Technology

1. Course Name: Functional Foods and Probiotics – PhD					
Food Proteins 1/PhD					
2. Course Code: Ag.F. 705					
Ag.F. 716					
3. Semester / Year:					
First Semester (Autumn) / 2025-2026					
4. Description Preparation Date:					
12/08/2025					
5. Available Attendance Forms:					
In presence					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 theoretical + 3 practical / (75 hours) 3 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Qaswaa Yousif Jameel					
8. Course Objectives					
1. To identify the fundamental concepts, materials, and types of food packaging technologies. 2. To understand the role of packaging in preserving food quality and extending shelf life. 3. To study the properties of different packaging materials and their effects on food safety. 4. To recognize modern packaging technologies such as smart and active packaging. 5. To develop students' ability to select appropriate packaging systems for various food products.					
9. Teaching and Learning Strategies					
- Interactive lectures. - Brainstorming sessions. - Dialogue and discussion. - Assignment-based tasks and report preparation. - Demonstrations of models and examples of food preservation methods. - Students are assigned to prepare a self-selected report topic and present it. - Group work assignments to identify and develop leadership skills. - Assignment of tasks and report writing for each experiment.					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the evolution of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials, digitally connected smart packages, and the assessment of various risks associated with packaging technologies. B1: Students will practice different packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Introduction to food packaging technology, its importance, and the concepts of advanced packaging. Identification of packaging tools and materials in the laboratory.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
2	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the evolution of smart and sustainable	Functions of packaging in food preservation. Examination of different types of food packaging.	theoretical: Auditory techniques, Presentations, Direct dialogue	theoretical: Short quizzes, assignments, discussions

		packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials, digitally connected smart packages, and the assessment of various risks associated with packaging technologies. A2: Students will gain an understanding of the key principles of advanced safety and risk assessment in modern packaging technologies, future research trends in food packaging technology, self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. B1: Students will practice different problem-solving methods in food manufacturing through measuring solution concentrations, preparation techniques, and various food processing methods, in addition to calculating the components involved in product formulation.		Practical: Assigning tasks and reports	Practical: Short quizzes, assignments, practical training
3	2Theoretical 3 practical	B1: Students will apply different problem-solving approaches in food manufacturing through measuring solution concentrations, preparation methods, and various food processing techniques, in addition to calculating the formulation components of food products. A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the development of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials and digitally connected smart packages, along with the assessment of risks in packaging technologies. A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging including self-healing packaging systems, and the principles of scientific innovation in smart and sustainable packaging systems.	Examination of different types of food packaging. Paper-based packaging materials and their properties. Testing the strength and durability of paper-based packaging materials.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
4	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the	Identification of different types of plastics used in packaging. Plastic packaging materials.	theoretical: Auditory techniques, Presentations, Direct dialogue	theoretical: Short quizzes, assignments,

		development of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials and digitally connected smart packaging, as well as the assessment of risks associated with packaging technologies. C1: Students will identify types of innovation and the requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and the evaluation of their potential risks. B1: Students will apply different problem-solving methods in food manufacturing through measuring solution concentrations, preparation techniques, and various food processing methods, in addition to calculating the components involved in food product formulation.		Practical: Assigning tasks and reports	discussions Practical: Short quizzes, assignments, practical training
5	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the development of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials and digitally connected smart packaging, along with the assessment of risks associated with packaging technologies. A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Comparison of the properties of glass and metal packaging. Glass and metal packaging materials.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
6	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the development of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional	Metal and glass packaging materials. Gas and moisture permeability in packaging materials.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical:

		packaging based on bioactive materials and digitally connected smart packaging, along with the evaluation of risks associated with packaging technologies. C1: Students will identify types of innovation and requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and assessment of their potential risks. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.			Short quizzes, assignments, practical training
7	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the development of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials and digitally connected smart packaging, along with the assessment of risks associated with packaging technologies. A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the principles of scientific innovation in smart and sustainable packaging systems. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Design of food packaging. Analysis of selected food packaging samples available in the market.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
8	2Theoretical 3 practical	C1: Students will identify types of innovation and requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and evaluation of their potential risks. B1: Students will apply various packaging methods such as smart	Vacuum packaging (Vacuum Packaging). Practical application of vacuum packaging techniques.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

		packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.			
9	2Theoretical 3 practical	A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. C1: Students will identify types of innovation and requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and evaluation of their potential risks. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Practical: Modified Atmosphere Packaging (MAP). Practical application of gas-based packaging techniques.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
10	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the development of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional packaging based on bioactive materials and digitally connected smart packaging, along with the assessment of risks associated with packaging technologies. A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Active packaging. Presentation of examples and models of active packaging materials.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

11	2Theoretical 3 practical	A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. C1: Students will identify types of innovation and requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and evaluation of their potential risks. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Smart packaging. Study of smart labels and indicators.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
12	2Theoretical 3 practical	A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. C1: Students will identify types of innovation and requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and evaluation of their potential risks. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Edible packaging and bio-based materials. Preparation of an edible film model.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
13	2Theoretical 3 practical	A1: Students will acquire knowledge of the concepts and requirements of advanced packaging, innovation in packaging systems, and the evolution of smart and sustainable packaging philosophies. They will also study different types of packaging, including functional	Modern packaging technologies.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical:

		packaging based on bioactive materials and digitally connected smart packaging, along with the assessment of risks associated with packaging technologies. A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Analysis of modern packaging techniques.		Short quizzes, assignments, practical training
14	2Theoretical 3 practical	A2: Students will gain an understanding of advanced safety principles and risk assessment in modern packaging technologies, future research trends in food packaging such as self-healing packaging, and the concepts of scientific innovation in smart and sustainable packaging systems. C1: Students will identify types of innovation and requirements of food packaging systems, with emphasis on sustainable packaging for functional foods and evaluation of their potential risks. B1: Students will apply various packaging methods such as smart packaging, active packaging, advanced modified atmosphere packaging, microbiome-responsive bio-packaging, and advanced printing technologies in food packaging, in addition to major innovations in packaging systems.	Food safety and packaging regulations. Study of nutritional labeling and food information panels.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
15	2Theoretical 3 practical	D1: Students will prepare a report on the field visit and identify the main problems observed in the industrial production sector. D1: Students will prepare a report on the field visit and identify the main problems observed in the industrial production sector.	Field visit to a food manufacturing and packaging plant, and preparation of a report based on students' observations during the visit. Field visit to a food manufacturing and packaging plant, and preparation of a report based on students' observations during the visit.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

11. Course Evaluation

t	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Final theoretical report + practical reports	Theory: 15 weeks Practical: 1-15 weeks	7 Theory + 6 Practical	%12
2	Short test (1) Quiz	3 rd week	2 Theory + 1 Practical	%3
3	Midterm exam (theory and practical)	9 th week	8 Theory + 4 Practical	%12
4	Short test (2) Quiz	12 th week	2 Theory + 1 Practical	%3
5	Final practical test	Practical exam week	20	%20
6	Final theory test	Theoretical exam week	50	%50
7	TOTAL		100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Theoretical / Learning Resources: A wide range of articles and research papers published by Springer, Elsevier, and Springer Nature.
Electronic References, Websites	

Lecturer (Theoretical):

Assoc. Prof. Dr. Qaswaa Yousif Jameel

Head of Scientific Committee:

Prof. Dr. Sumia Khalaf Badawi

Lecturer (Practical):

Assoc. Prof. Dr. Qaswaa Yousif Jameel

Head of Food Science Department:

Assoc. Prof. Dr. Taha Mohammed Taqi



(Signature)
 الأستاذ المساعد الدكتور
 طه محمد تقي محمد

Course Description (PhD): Functional Foods and Probiotics

1. Course Name: Functional Foods and Probiotics – PhD

Food Proteins 1/PhD

2. Course Code: Ag.F. 705

Ag.F. 705

3. Semester / Year:

First Semester (Autumn) / 2025-2026

4. Description Preparation Date:

12/08/2025

5. Available Attendance Forms:

In presence

6. Number of Credit Hours (Total) / Number of Units (Total)

2 theoretical + 3 practical / (75 hours) 3 units

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Qaswaa Yousif Jameel

8. Course Objectives

Theoretical:

Enabling students to understand and comprehend concepts related to functional foods and probiotics.

Practical:

Enabling students to identify the major methods of incorporating probiotics into foods to transform them into functional foods.

9. Teaching and Learning Strategies

Theoretical:

Interactive lectures

Brainstorming sessions

Dialogue and discussion

Assignment-based tasks and report preparation

Students are assigned to prepare a self-selected report topic and present it for discussion with their peers.

Practical:

Assigning group work activities to assess students' skills.

Requiring students to write reports for each laboratory experiment related to every practical lesson.

Conducting unannounced short quizzes based on the material explained during the current lecture.

Interactive lectures.

Brainstorming sessions.

Dialogue and discussion.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical 3 practical	theoretical: A1: Students will acquire knowledge of the fundamental concepts of functional foods, the safety of probiotics, methods for selecting probiotics according to their properties, their stability during storage, effective dosages, and their role in promoting health and preventing diseases.	theoretical: Historical overview of probiotics. Practical: Evaluation of bacteria as probiotics, with a focus on Lactobacillus acidophilus.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

		practical: B1: Students will practice different methods for evaluating various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.			
2	2Theoretical 3 practical	theoretical: A1: Students will acquire knowledge of the fundamental concepts of functional foods and the safety of probiotics, methods for selecting probiotics according to their properties, their stability during storage, effective dosages, and their role in promoting health and preventing diseases. A2: Students will gain an understanding of the main characteristics of functional foods and probiotics, their working conditions and stability during storage, their types, and their effects on various physiological functions within the body, in addition to different types of functional foods and functional dairy products. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Safety of probiotics and the regulatory status of probiotics. Practical: Evaluation of bacteria as probiotics, with a focus on <i>Lactobacillus plantarum</i>.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

3	2Theoretical 3 practical	Theoretical: C1: Students will demonstrate understanding of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, while considering quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Selection of probiotics based on their properties. Practical: Evaluation of bacteria as probiotics, with a focus on <i>Lactobacillus rhamnosus</i>.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
4	2Theoretical 3 practical	Theoretical: A2: Students will gain an understanding of the main characteristics of functional foods and probiotics, their operating conditions and stability during storage, their types, and their effects on various physiological functions within the body, in addition to different types of functional foods and functional dairy products. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Stability of probiotics during storage. Practical: Evaluation of bacteria as probiotics, with a focus on <i>Bifidobacterium</i> spp.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

5	2Theoretical 3 practical	Theoretical: A1: Students will acquire knowledge of the fundamental concepts of functional foods and probiotic safety, methods for selecting probiotics based on their properties, their stability during storage, effective dosages, and their role in promoting health and preventing diseases. A2: Students will gain an understanding of the main characteristics of functional foods and probiotics, their operating conditions and stability during storage, their types, and their effects on various physiological functions within the body, in addition to different types of functional foods and functional dairy products. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: The role of probiotics and their relationship to health and disease, including the minimum effective dose. Practical: Evaluation of bacteria as probiotics, with a focus on Lactobacillus casei.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
6	2Theoretical 3 practical	Theoretical: A2: Students will gain an understanding of the main characteristics of functional foods and probiotics, their operating conditions and stability during storage, their types, and their effects on various physiological functions within the body, in addition to different types of functional foods and functional dairy products.	Theoretical: Storage and preservation of probiotics. Practical: Evaluation of the effectiveness of a mixture of different probiotic strains.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

		Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.			
7	2Theoretical 3 practical	Theoretical: A2: Students will gain an understanding of the main characteristics of functional foods and probiotics, their operating conditions and stability during storage, their types, and their effects on various physiological functions within the body, in addition to different types of functional foods and functional dairy products. C1: Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, while considering quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Probiotics: definition, standards, types, and sources of probiotics. Practical: Growth of lactic acid bacteria in nutrient broth.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

8	2Theoretical 3 practical	Theoretical: A1: Students will acquire knowledge of the fundamental concepts of functional foods and probiotic safety, methods for selecting probiotics based on their properties, their stability during storage, effective dosages, and their role in promoting health and preventing diseases. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: The relationship between probiotics and the intestinal microbiota, and the health benefits of probiotics. Practical: Growth of lactic acid bacteria in milk.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
9	2Theoretical 3 practical	Theoretical: C1: Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, while considering quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Functional dairy products. Practical: Growth of lactic acid bacteria in whey.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

10	2Theoretical 3 practical	Theoretical: A2: Students will gain an understanding of the main characteristics of functional foods and probiotics, their operating conditions and stability during storage, their types, and their effects on various physiological functions within the body, in addition to different types of functional foods and functional dairy products. C1: Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, while considering quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical: B1: Students will apply different methods to evaluate various types of probiotics, distinguish between beneficial bacterial strains and different bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Functional dairy products and their therapeutic applications. Practical: Survival of probiotics in fermented dairy products.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
11	2Theoretical 3 practical	Theoretical (C1): Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, with emphasis on quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications.	Theoretical: Health benefits of fermented dairy products such as yogurt and cheese. Practical: Antimicrobial properties of functional dairy products.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

		Practical (B1): Students will apply various methods to evaluate different types of probiotics, distinguish between beneficial bacterial strains and bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.			
12	2Theoretical 3 practical	Theoretical (C1): Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, with emphasis on quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical (B1): Students will apply various methods to evaluate different types of probiotics, distinguish between beneficial bacterial strains and bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Kefir, Kumis, and Yakult as functional fermented dairy products. Practical: Functional properties of probiotics in fermented products.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
13	2Theoretical 3 practical	Theoretical (C1): Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, with emphasis on quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical (B1): Students will apply various methods to evaluate different types of probiotics, distinguish between beneficial bacterial strains	Theoretical: Fermented whey beverages. Practical: Evaluation of the effect of adding different types of prebiotics on the growth of probiotics.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

		and bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.			
14	2Theoretical 3 practical	Theoretical (C1): Students will demonstrate knowledge of the scientific principles involved in the design and production of functional foods and all types of functional dairy products, with emphasis on quality and safety standards, as well as the technological properties of bioactive components and their therapeutic applications. Practical (B1): Students will apply various methods to evaluate different types of probiotics, distinguish between beneficial bacterial strains and bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Cereal-based dairy foods. Practical: Probiotics.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
15	2Theoretical 3 practical	Theoretical (D1): Students will prepare a report on a scientific visit and the latest applied developments in probiotic preservation, and will deduce their potential applications in modern food industries. Practical (B1): Students will apply various methods to evaluate different types of probiotics, distinguish between beneficial bacterial strains and bioactive compounds, and explain their mechanisms of action, growth requirements, and stability in food products.	Theoretical: Field visit to a probiotic storage facility and preparation of a report based on students' observations during the visit. Practical: Prebiotics and probiotics.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

11. Course Evaluation

t	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Final theoretical report + practical reports	Theory: 15 weeks Practical: 1-15 weeks	7 Theory + 6 Practical	%12
2	Short test (1) Quiz	3 rd week	2 Theory + 1 Practical	%3
3	Midterm exam (theory and practical)	9 th week	8 Theory + 4 Practical	%12
4	Short test (2) Quiz	12 th week	2 Theory + 1 Practical	%3
5	Final practical test	Practical exam week	20	%20
6	Final theory test	Theoretical exam week	50	%50
7	TOTAL		100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Theoretical / Learning Resources: A wide range of articles and research papers published by Springer, Elsevier, and Springer Nature.
Electronic References, Websites	

Lecturer (Theoretical):

Assoc. Prof. Dr. Qaswaa Yousif
Jameel

Head of Scientific Committee:

Prof. Dr. Sumia Khalaf Badawi

Lecturer (Practical):

Assoc. Prof. Dr. Qaswaa Yousif
Jameel

Head of Food Science Department:

Assoc. Prof. Dr. Taha Mohammed
Taqi



(Handwritten signature)
 الأستاذ المساعد الدكتور
 طه محمد تقي محمد

Course Description Form

1. Course Name:

Food Proteins 1/PhD

2. Course Code:

Ag.F.701

3. Semester / Year:

First Semester (Autumn) / 2025-2026

4. Description Preparation Date:

12/08/2025

5. Available Attendance Forms:

In presence

6. Number of Credit Hours (Total) / Number of Units (Total)

2 theoretical + 3 practical / (75 hours) 3 units

7. Course administrator's name (mention all, if more than one name)

Name: Prof. Dr. SUMYIA KHALAF BADAWI

8. Course Objectives

1. Understanding the chemical structure of proteins.
2. Studying the chemical and physical changes that occur to proteins during manufacturing processes such as pasteurization, fermentation, and drying.
3. Studying the amino acids that make up milk proteins.
4. Methods of milk protein synthesis in the mammary gland.
5. Studying sensitivity to milk proteins.
6. Enabling the student to compare the differences between milk proteins.
7. Evaluating the best methods for estimating milk proteins.

9. Teaching and Learning Strategies

1. Interactive lecture
2. Brainstorming
3. Dialogue and discussion
4. Report assignments

5. Monthly and daily exams

6. Self-directed learning

7. Practical exercises

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical 3 practical	theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins. practical: c2: The student will apply different analyses to milk proteins.	theoretical: General Introduction to Milk Proteins Practical: Methods of Precipitating Milk Proteins	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
2	2Theoretical 3 practical	theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins Practical: c2: The student will apply different analyses to milk proteins.	theoretical: Milk proteins: classification and separation methods Practical: Methods of precipitating milk proteins using coagulating enzymes and centrifugation	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
3	2Theoretical 3 practical	theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins. Practical: c2: The student will apply different analyses to milk proteins.	theoretical: Milk caseins and casein body theories Practical: Protein estimation using the Kjeldal method (digestion)	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
4	2Theoretical 3 practical	theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins.	theoretical: Chemical structure and genetic origin of alpha-casein	theoretical: Auditory techniques, Presentations, Direct dialogue	theoretical: Short quizzes, assignments, discussions

		practical: c2: The student will apply different analyses to milk proteins.	Practical: Protein estimation by Kjeldal method (distillation)	Practical: Assigning tasks and reports	Practical: Short quizzes, assignments, practical training
5	2Theoretical 3 practical	theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins. practical: c2: The student will apply different analyses to milk proteins.	theoretical: Chemical structure and genetic origin of kappa casein Practical: Protein estimation using colorimetric methods	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
6	2Theoretical 3 practical	theoretical: C1: The student will deduce the chemical composition and physical properties of milk proteins. Practical: C4: The student will test their practical knowledge.	theoretical: Chemical structure and genetic origin of beta and gamma casein Practical: Midterm exam	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
7	2Theoretical 3 practical	theoretical: c3: The student demonstrates the functional properties of milk proteins in dietary systems. practical : c2: The student applies different analyses of milk proteins.	theoretical: Whey proteins and their functional properties Practical: Whey protein acetylation	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
8	2Theoretical 3 practical	theoretical: c4: The student tests their theoretical knowledge. practical: c2: The student applies different analyses of milk proteins.	theoretical: Midterm Exam practical: Chemical Reactions of Amino Acids	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

9	2Theoretical 3 practical	theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins. practical : c2: The student will apply different analyses to milk proteins.	theoretical: Chemical structure, physical properties, and genetic origin of whey proteins Practical: Study of functional properties: coagulation, foaming, and water binding	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
10	2Theoretical 3 practical	Theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins. practical : c2: The student will apply different analyses to milk proteins.	Theoretical: Immunological proteins Practical: Whey protein segregation	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
11	2Theoretical 3 practical	Theoretical: c3: The student demonstrates the characteristics of protein synthesis in the mammary gland. Practical: c2: The student applies different analyses of milk proteins.	Theoretical: Synthesis of milk proteins practical: Discussion of the mechanism of protein synthesis in the mammary gland	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
12	2Theoretical 3 practical	Theoretical: e1: The student participates in a scientific visit to a specialized laboratory. practical : c2: The student applies different analyses of milk proteins.	Theoretical: A scientific visit to a specialized laboratory. practical: Discussion of the mechanism of protein synthesis in the mammary gland.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
13	2Theoretical 3 practical	Theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins.	Theoretical: Milk protein allergy	theoretical: Auditory techniques, Presentations, Direct dialogue	theoretical: Short quizzes, assignments, discussions

		Practical: c2: The student will apply different analyses to milk proteins.	Practical: Separation of a mixture of amino acids by chromatography	Practical: Assigning tasks and reports	Practical: Short quizzes, assignments, practical training
14	2Theoretical 3 practical	Theoretical: c1: The student will deduce the chemical composition and physical properties of milk proteins. practical: c2: The student will apply different analyses to milk proteins.	Theoretical: Milk Enzymes practical: The student applies milk coagulation using chymosin.	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training
15	2Theoretical 3 practical	Theoretical: c3: The student demonstrates the effect of manufacturing processes on milk proteins. practical: c2: The student applies different analyses to milk proteins.	Theoretical: Manufacturing processes Practical: The effect of heat treatments on whey proteins	theoretical: Auditory techniques, Presentations, Direct dialogue Practical: Assigning tasks and reports	theoretical: Short quizzes, assignments, discussions Practical: Short quizzes, assignments, practical training

11. Course Evaluation

t	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Final theoretical report + practical reports	Theory: 15 weeks Practical: 1-15 weeks	7 Theory + 6 Practical	%12
2	Short test (1) Quiz	3 rd week	2 Theory + 1 Practical	%3
3	Midterm exam (theory and practical)	9 th week	8 Theory + 4 Practical	%12
4	Short test (2) Quiz	12 th week	2 Theory + 1 Practical	%3
5	Final practical test	Practical exam week	20	%20
6	Final theory test	Theoretical exam week	50	%50
7	TOTAL		100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	General dairy principles,
Main references (sources)	Dairy Chemistry, Dairy Science and Technology, Advanced Dairy Chemistry, and reliance on the curriculum prepared by the subject teacher.
Recommended books and references (scientific journals, reports...)	Many journals, including Dairy Science and Dairy Research
Electronic References, Websites	Research Gate, Google Scholler...ETC

Theoretical Course Instructor

Prof. Dr. SUMYIA KHALAF BADAWI

Practical Course Instructor

Prof. Dr. SUMYIA KHALAF BADAWI

Head of the Scientific Committee

Prof. Dr. SUMYIA KHALAF BADAWI

Head of the Food Science Department

Dr. Taha Muhammad Taqi Muhammad




 الاستاذ المساعد الدكتور
 طه محمد تقي محمد

Course Description Form

1. Course Name:	
Modern Food Processing Technologies (2)	
2. Course Code:	
Ag.F.704	
3. Semester / Year:	
Second Semester / Postgraduate (Ph.D.) / 2025–2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
Attendance lesson	
6. Number of Credit Hours (Total) / Number of Units (Total): units	
Theoretical: 2 hours and practical: 3 hours (5 hours) / 3.5 units	
7. Course administrator's name (mention all, if more than one name):	
Name: Asst. Prof. D. Basmaa Saaduldeen Sheet Email: dr.basmaa@uomosul.edu.iq	
8. Course Objectives	
Theoretical: - Enable students to understand the basic principles of natural polymers used in edible food packaging. - Enable students to understand the benefits of using ultrasound technology. - Explain the safety aspects of food irradiation. - Introduce students to the mechanism of ultrasound and types of non-thermal processing technologies. - Develop students' academic and analytical skills.	Practical: - Assign students to group work to perform experiments and discover their skills. - Enable students to gain knowledge through self-directed learning. - Require students to write a report for each experiment.
9. Teaching and Learning Strategies	
Theoretical: - Interactive lectures - Brainstorming - Dialogue and discussion - Practical exercises -Using educational videos from YouTube to demonstrate unavailable equipment -PowerPoint presentations -Spontaneous analytical questions during discussions	Practical: - Group assignments to perform experiments and enhance skills - Self-directed learning - Writing reports for each experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Name of Unit or subject	Learning method	Evaluation method
1	2Theoretical 3 Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of pulsed electrical current and its role in food preservation . PRACTICAL: a2: Demonstrates the steps for operating a pulsed electrical current device by watching a video..	THEORETICAL: Using pulsed electrical current in food preservation. PRACTICAL: Watch video	THEORETICAL: Audio-visual methods, writing on the board, and direct dialogue style. PRACTICAL: Assignments and report writing.	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
2	2Theoretical 3 Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of food irradiation and its role in .food preservation PRACTICAL: a2: Explains the steps of radiation's effect on microbial cells through video viewing	THEORETICAL: Food irradiation PRACTICAL: Watch video.	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
3	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of ultrasound and role in food preservation. PRACTICAL: b1: Uses ultrasound in juice processing..	THEORETICAL: The use of ultrasound in food preservation and its applications. PRACTICAL: Watch video .	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
4	2Theoretical 3Practical	THEORETICAL: a1: Understanding the basic concepts and scientific applications of high hydrostatic pressure and its role in food preservation	THEORETICAL: High hydrostatic pressure and its applications in food	THEORETICAL: Auditory methods Writing on the board Direct dialogue method	THEORETICAL: Quick and monthly exams, homework assignments, discussions

		PRACTICAL: b2: Explains the process flow chart for high-pressure food processing.	PRACTICAL: Watch video	PRACTICAL: Assigning tasks and reports	PRACTICAL: Quick exams, homework assignments, practical training
5	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of cold plasma, and its role in food preservation. PRACTICAL: a2: Demonstrates the effects cold plasma by watching a video.	THEORETICAL: Cold plasma technology and its effect on microorganisms PRACTICAL: Watch video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
6	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of smart and active packaging and its role in food preservation. PRACTICAL: a2: Demonstrates the components of a cold plasma system by watching a video.	THEORETICAL: Smart and Active Packaging PRACTICAL: Watch a video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
7	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of different pasteurization methods and their role in food preservation. PRACTICAL: b2: Distinguishes between the moisture content of the raw material and the extrusion temperature, and their effect on product expansion, by watching a video..	THEORETICAL: Food Pasteurization PRACTICAL: Watch a video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
8	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of 3D printing and its role in food	THEORETICAL: 3D Printing	THEORETICAL: Auditory methods Writing on the board Direct dialogue	THEORETICAL: Quick and monthly exams, homework assignments, discussions

		preservation. PRACTICAL: b2: Identifies the basic tools and materials for 3D printing watching a video.	PRACTICAL: Watch a video	method PRACTICAL: Assigning tasks and reports	PRACTICAL: Quick exams, homework assignments, practical training
9	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of freeze-drying and its role in food preservation. PRACTICAL: b2: Identifies the optimal operating conditions (pressure and temperature) of a freeze-dryer by watching a video.	THEORETICAL: Freeze-drying PRACTICAL: Watch a video.	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
10	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of rapid pasteurization, ultra-high temperature (UHT) treatment and commercial sterilization and their role in food preservation. PRACTICAL: c1: Distinguishes the conditions for heat treatment (time and temperature) of different techniques through video analysis.	THEORETICAL: Rapid pasteurization ultra-high temperature (UHT) treatment, and commercial sterilization (retort) PRACTICAL: Watch a video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training

11	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of disinfectants and their role in affecting the quality and safety of food and dairy products. PRACTICAL: b2: Identifies the appropriate Clean-In-Place (CIP) method each device by watching a video.	THEORETICAL: Use of disinfectants food and dairy factories PRACTICAL: Watch a video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
12	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of various devices and their role in the food industry.. PRACTICAL: a1: Demonstrates the practical realities of the laboratory and provides solutions to operational problems through video analysis.	THEORETICAL: A scientific visit was cancelled due to circumstances. PRACTICAL: Watch a video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
13	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of ozone and its role in food preservation. PRACTICAL: b2: Distinguishes between methods of ozone generation and its applications in food and water sterilization by watching a video.	THEORETICAL: Ozone PRACTICAL: Watch a video	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training
14	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of different types of membranes and their role in food preservation. PRACTICAL: b2: Distinguishes between operational methods membrane separation processes by watching a video.	THEORETICAL: Types of membranes: microfiltration, ultrafiltration, nanofiltration, reverse osmosis.. PRACTICAL: Watch a video.	THEORETICAL: Auditory methods Writing on the board Direct dialogue method PRACTICAL: Assigning tasks and reports	THEORETICAL: Quick and monthly exams, homework assignments, discussions PRACTICAL: Quick exams, homework assignments, practical training

15	2Theoretical 3Practical	THEORETICAL: a1: Understands the basic concepts and scientific applications of vacuum drying and foam drying and their role in food preservation. PRACTICAL: b2: Identifies the mechanical workings of vacuum and foam drying equipment through video observation.	THEORETICAL: Vacuum drying and foam drying. PRACTICAL: Watch a video.	THEORETICAL: Report Writing Method PRACTICAL: Assigning a Report	THEORETICAL: Discussing the visit PRACTICAL: Discussing the problem and how to solve it
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11. Course Evaluation

	Calendar methods	Calendar date (week)	Degree	Relative weight %
	A short theoretical test Quiz	Weeks: 1,3,4,5,9,12	12	12
	Assigning theoretical tasks	Weeks: 1,2,6,8,11,13,14	10.5	10.5
	Semester (1) theoretical test	Seventh	20	20
	Semester (2) theoretical test	The tenth	20	20
	Assignment of a theoretical report	Fifteenth	2.5	2.5
	Semester (1) practical test	Fifth	10	10
	Semester (2) practical test	The tenth	10	10
	A short practical test Quiz	Weeks: 3, 6, 7, 9, 13	5	5
	Commissioning a practical report	Weeks: 1,2,3,4,6,8,9,11,12,14,15	10	10
	The total	100	100%	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	There is none.
Main references (sources)	"From Google Scholar and Research Gate websites, ChatGPT, using artificial intelligence based on published research
Recommended books and references (scientific journals, reports...)	There is none
Electronic References, Websites	"From Google Scholar and Research Gate websites, ChatGPT, using artificial intelligence based on published research

مدرس المادة النظري
أ.م.د. بسماء سعد الدين شيت

رئيس قسم علوم الأغذية

أ.م.د. طه محمد تقي

رئيس اللجنة العلمية
أ.د. سميرة خلف بدوي




الأستاذ المساعد الدكتور
طه محمد تقي محمد

وصف مقرر لغة انكليزية 3 متقدم/ دراسات عليا/ دكتوراه/ قسم علوم الاغذية

1.	اسم المقرر:
	لغة انكليزية 3 متقدم
2.	رمز المقرر:
	Ag.F.
3.	الفصل / السنة: السنوي
	الفصل الدراسي الاول (الخريفي)/ الدراسات العليا/الدكتوراه/ قسم علوم الاغذية 2025-2026
4.	تاريخ إعداد هذا الوصف
	2025/9/1
5.	أشكال الحضور المتاحة :
	حضور
6.	عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي):
	2 ساعة نظري/ وحدة واحدة
7.	اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر)
	أ.م. د. ارقم محمد ازهر
8.	اهداف المقرر
	• أهداف المقرر : • تمكين الطلبة على معرفة اهمية اللغة الانكليزية في مرحلة البحث العلمي ومرحلة كتابة البحث العلمي • اهمية برنامج اللغة الانكليزية في الجانب البحثي و الحياة اليومية واهمية هذه المادة واستخدامها في البعثات والزمالكات الدراسية وفي كتابة خلاصة البحث العلمي والبحوث الاجنبية في مستوعبات سكوبس وكلاريفيت. • ايجاد افضل الوسائل لشرح البرنامج المقترح والتعرف على خصائص الاجهزة بشكل دقيق واستخدامها في تقديم البحوث باللغة الانكليزية كالبوربوينت والبوسترات. • كيفية توظيف التقنية الحديثة في تحسين وتطوير البرنامج المقترح لمادة اللغة الانكليزية.
9.	استراتيجيات التعليم والتعلم
	- المحاضرة التفاعلية - العصف الذهني - الحوار والمناقشة - التدريب الميداني - التدريبات العملية - المشروع الميداني - التعلم الذاتي

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	2 نظري	نظري مقدمة عن اهمية مادة اللغة الانكليزية بالنسبة لطلبة الدراسات العليا	مقدمة عامة عن اللغة الانكليزية	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اسئلة متنوعة في مبادئ اللغة
2	2 نظري	نظري a1: التعرف عن كيفية كتابة ملخص بطريقة علمية اكااديمية صحيحة باللغة الانكليزية	تنظيم وترتيب مراقبة الجودة في المصانع والنقاط الحرجة لمراقبة سلامة المنتجات	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار فصلي 1، اختبار نهائي
3	2 نظري	نظري a1: يتعرف عن كيفية تجاوز الاستلال النصي والفكري واهمية قواعد اللغة في كتابة البحوث والأطاريح b1: يمثل التقييم الفعلي لعرض اسلوب كتابة البحث العلمي بطريقة تمثل تجاوز الاستلال	اساسيات تجاوز الاستلال في كتابة البحث العلمي	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار فصلي 1، اختبار نهائي، واجب بيتي
4	2 نظري	نظري a1: يتعرف على أهمية تقسيم قواعد اللغة الانكليزية والتعرف على اقسامها المختلفة، وكيفية استخدام مهارات هذه القواعد في تجاوز الاستلال النصي في كتابة البحث العلمي b1: تمثيل قيم القواعد الاساسية في مادة اللغة الانكليزية	اساسيات قواعد اللغة الانكليزية والتعرف على اقسامها المختلفة	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار فصلي 1، اختبار نهائي، تقرير
5	2 نظري	نظري a1: يتعرف على اهم مهارات القراءة السريعة في اختيار البحث المناسب للباحث b1: يمثل التقييم السريع لمهارات القراءة للبحث المناسب.	التعرف على اهم نقاط القراءة السريعة لمادة اللغة الانكليزية	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار فصلي 1، اختبار نهائي، تقرير
6	2 نظري	نظري a1: يتعرف على اهم مبادئ واهمية استخدام زمن المضارع البسيط والمضارع التام في المبني للمعلوم والمبني للمجهول في تجاوز الاستلال النصي b1: يمثل التقييم الواقعي في كيفية استخدام زمن المضارع البسيط والمضارع التام.	اهمية زمن المضارع التام والبسيط في المبني للمجهول	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار قصير، اختبار نهائي، واجب بيتي

اختبار فصلي2، اختبار نهائي	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اهمية الزمن الماضي البسيط والتام	نظري a1: يتعرف على اهم مبادئ واهمية استخدام زمن الماضي البسيط والماضي التام في المبني للمعلوم والمبني للمجهول في تجاوز الاستلال النصي b1: يمثل التقييم الفعلي لزمن الماضي البسيط والتام وكيفية استخدامه في كتابة البحوث الاكاديمية.	2 نظري	7
اختبار فصلي2، اختبار نهائي	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	امتحان فصلي	نظري a1: يتعرف على اهم مبادئ زمن المضارع المستمر والماضي المستمر في المبني للمعلوم والمبني للمجهول b1: يمثل التقييم الفعلي لزمن المضارع المستمر والماضي المستمر في المبني للمعلوم والمبني للمجهول	2 نظري	8
اختبار فصلي2، اختبار نهائي	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اهم مبادئ واهمية تقديم البوربوينت والبوسترات للبحوث باللغة الانكليزية بطريقة اكاديمية علمية	نظري a1: يتعرف على اهم مبادئ واهمية تقديم البوربوينت والبوسترات للبحوث باللغة الانكليزية بطريقة اكاديمية علمية b1: يمثل التقييم الطلابي في استخدام وعرض البوربوينت والبوسترات	2 نظري 3 عملي	9

10	2 نظري	نظري a1: يتعرف على اهم مبادئ استخدام ادوات الربط لربط جملتين مختلفتين b1: يمثل التقييم التطبيقي في استخدام ادوات الربط في كتابة الخلاصة والبحوث العلمية	استخدام ادوات الربط في كتابة الخلاصة والبحوث العلمية	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار فصلي 2
11	2 نظري	نظري a1: يتعرف على اهم مبادئ واهمية ظروف الربط واهمية استخدامها في كتابة الخلاصة وكتابة البحث العلمي b1: يمثل التقييم الفعلي في استخدام ادوات الربط	استخدام ادوات الربط	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار نهائي
12	2 نظري	نظري a1: يتعرف على اهم مبادئ واهمية مهارات استخدام التنقيط واهمية في كتابة البحوث العلمية b1: يمثل التقييم التطبيقي في كتابة البحث العلمي متبع جميع تعليمات الكتابة من تنقيط الصحيح واستخدام ادوات المقارنة الصحيحة	مهارات استخدام التنقيط واهمية في كتابة البحوث العلمية ، وكذلك اهمية درجات المقارنة	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار نهائي
13	2 نظري	نظري a1: يتعرف على اهم مبادئ كتابة الخلاصة بشكل عام ونهائي بما يوافق المجالات العالمية التابعة لمستويات سكويس	الامتحان الثاني	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار نهائي 2

14	2 نظري 3 عملي	نظري a1: يتعرف على اهم مبادئ النشر في مستويات سكوبس وما له اهمية في احتساب النقاط عند اكمال متطلبات شهادة الدكتوراه. b1: يمثل التقييم النهائي في التطبيق الواقعي لألية النشر في المجالات العالمية، والتعرف على اهم الخبرات التي تنتج للطلاب من خلالها التقديم على الدراسات العليا بالمستقبل.	اهمية النشر في مستويات سكوبس والمجلات العالمية	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار قصير، اختبار نهائي
15	2 نظري 3 عملي	نظري a1: يتعرف على اهمية مراجعة المادة بشكل سريع لمادة اللغة الانكليزية متقدم لطلبة الدكتوراه	مراجعة شاملة	المحاضرة التفاعلية، العصف الذهني، الحوار والمناقشة، التعلم الذاتي	اختبار قصير، اختبار نهائي

11. تقييم المقرر

ت	أساليب التقييم	موعد التقييم (أسبوع)	الدرجة	الوزن النسبي %
1	تقرير 1	الاسبوع الرابع	2.5	2.5
2	تقرير 2	الاسبوع الخامس	2.5	2.5
3	اختبار قصير (1) Quiz	الاسبوع السادس	2	2
4	اختبار قصير (2) Quiz	الاسبوع الرابع عشر	2	2
5	اختبار قصير (3) Quiz	الاسبوع الخامس عشر	1	1
6	اختبار فصلي (1)	الاسبوع السادس	7.5	7.5
7	اختبار فصلي (2)	الاسبوع الحادي عشر	7.5	7.5
8	اختبار نظري نهائي	امتحانات الفصل النهائي	40	40
9	مشروع ميداني عملي	الاسبوع الخامس عشر	5	5
10	تقييم حقلي	الاسبوع الثالث والخامس	2	2
11	اختبار قصير عملي (1) Quiz	الاسبوع الاول	1	1
12	اختبار قصير عملي (2) Quiz	الاسبوع الرابع	0.5	0.5
13	اختبار قصير عملي (3) Quiz	الاسبوع الرابع عشر	1	1
14	الواجبات البيتية	الاسابيع 6 و8 و10 و11 و12 و13	5.5	5.5
15	اختبار عملي نهائي	امتحانات الفصل النهائي	20	20
	المجموع	100	%100	%100

12. مصادر التعلم والتدريس

1- الكتب المقررة المطلوبة	Oxford Book for learning English Language3
2- المراجع الرئيسية (المصادر)	Advanced Cambridge Book
ا- الكتب والمراجع التي يوصى بها (المجلات العلمية , التقارير ,)	المكتبة, مواقع علمية بالانترنت , الاطلاع على المحاضرات للجامعات العراقية الأخرى.

مدرس المادة النظري
أ.م. د. ارقم محمد ازهر

رئيس قسم علوم الاغذية
أ. م. د. طه محمد تقي محمد

رئيس اللجنة العلمية
أ. د. سمية خلف بدوي




الاستاذ المساعد الدكتور
طه محمد تقي محمد

Course Description Form/Graduate studies/ Master

1. Course Name:

Quality control

2. Course Code:

Ag.F. 715

3. Semester / Year:

Second semester (spring)/Graduate studies/PhD/Food science/ 2025-2026

4. Description Preparation Date:

1/2/2026

5. Available Attendance Forms:

Attendance lesson

6. Number of Credit Hours (Total) / Number of Units (Total): units

30 hours/30 units+ 45 hours/

7. Course administrator's name (mention all, if more than one name):

Name: Assistant professor dr. Oday hasan ali al-jammaas

Email: dr.oday_aljammaas@uomosul.edu.iq

8. Course Objectives

- • Enabling the student to understand and comprehend the principles of quality and its importance.
- Enabling the student to know how to organize and arrange quality control in factories and critical points to monitor product safety.
- • Enabling the student to become familiar with the basics of the system and its programs and to analyze the risks and damages to which food products are exposed.
- Enabling the student to identify chemical pollution and its risks.
- The student can judge the efficiency of monitoring at different production points.
- Enabling the student to identify the authorities responsible for the safety and quality of food and dairy products within the scope of different countries of the world.

9. Teaching and Learning Strategies

Interactive lecture with the use of presentations – dialogue Discussion - brainstorming - assigning tasks and reporting.

Assigning group work and revealing students' skills - assignment
Assignments to write a report for
each experiment.

10. Course Structure

Week	Hours	Required Learning Outcomes	Name of Unit or subject	Learning method	Evaluation method
First	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Introduction to the definition of quality, its principles and importance practical: Microbial evaluation of different locations of a food factory (soft drink factory)	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Second	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Organizing and arranging quality control in factories and critical points to monitor production safety practical: Microbial evaluation of different locations of a food factory (cheese factory)	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Third	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: System basics, software, and risk analysis practical: Microbial evaluation of raw materials for a dairy product	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Fourth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various	Theoretical: Chemical Pollution: What Are the Hazards and How Are They Determined? practical: Microbial evaluation of raw materials for a food product (soft drink)	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions

		food products is presented in flowchart and the extent to which their results conform to the established standard specifications.			
Fifth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Critical control points include monitoring at various production points practical: Chemical evaluation of the final product (tomato paste)	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Sixth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Monitoring and tracking of dairy products practical: Chemical evaluation of the final product (ice cream)	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Seventh	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: First exam practical: First exam	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
eighth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the	Theoretical: Monitoring and tracking food products such as jams practical: Microbial evaluation of a dairy product	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions

		established standard specifications.			
Ninth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Authorities responsible for the safety and quality of food products in Iraq and various countries around the world practical: Microbial evaluation of a food product	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Tenth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Legislation for the quality control of dairy products practical: The extent to which the facilities of a food factory building comply with the design requirements in terms of construction and health safety	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Eleventh	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Legislation for the quality control of dairy products practical: Estimation of BOD and microbial load of wastewater from industrial processes	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Twelveth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Standard specifications for various food products practical: Estimation of water hardness and calcium in water	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Thirteenth	2Theoretical 3Practical	Theoretical: a1:	Theoretical: Second exam	Theoretical: Auditory methods	Short exams, assignments,

		Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications. Practical: b1: Represents the metals and all used in the manufacture of food laboratory equipment in the form of a flow chart.	practical: Second exam	Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	or discussions
Fourteenth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Standard specifications for various dairy products Practical: Determination of magnesium in water	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions
Fifteenth	2Theoretical 3Practical	Theoretical: a1: Learn the most important principles and importance of food quality Practical: b1: The chemical, physical and microbial evaluation of various food products is presented in a flowchart and the extent to which their results conform to the established standard specifications.	Theoretical: Food Codex Practical: Determination of sulfate in water	Theoretical: Auditory methods Writing style on the blackboard Direct dialogue style practical : Assigning tasks and reporting	Short exams, assignments, or discussions

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc . The average is calculated from 25 for theory, as well as for practical, with an average of 15.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Quality Control Book / Written by Dr. Shin Samano Gerges
Main references (sources)	Quality control in fruit and vegetable

	processing 6 th 6 th edition year 2023
Recommended books and references (scientific journals, reports...)	Journal of food quality
Electronic References, Websites	IFT meeting food quality division https://www.ift.org/community/interest-groups-divisions/food-engineering-division

Instructor of theoretical part

Assistant Prof. Dr. Oday hasan ali al-jammaas

Instructor of practical part

Assistant Prof. Dr. Oday hasan ali al-jammaas

Chairman of scientific committee

Assistant Prof. Dr. Taha Mohammed Taqi Mohammed

Head of the department of Food science

Assistant Prof. Dr. Taha Mohammed Taqi Mohammed



Handwritten signature of Dr. Taha Mohammed Taqi Mohammed, Assistant Professor, Department of Food Science.