

**Ministry of Higher Education and Scientific  
Research  
Scientific Supervision and Scientific Evaluation  
Apparatus  
Directorate of Quality Assurance and Academic  
Accreditation  
Accreditation Department**



**Academic Program and Course  
Description Guide (Department of  
Horticulture and Landscape  
Gardening**

**2024**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

University Name: University of Anbar

Faculty/Institute: College of Agriculture

Scientific Department: Horticulture and land scope gardening

Academic or Professional Program Name: Courses (Autumn course and spring course)

Final Certificate Name: BSc in Agricultural sciences

Academic System: By Semester

Description Preparation Date: 28/03/ 2024

File Completion Date: 29/03/ 2024

Signature:

Head of Department Name:

Prof. Dr. Shamil I. Neamah

Date: 14 / 4 / 2024

Signature:

Scientific Associate Name:

Assist. Prof. Dr. Osama Hussein Mahedi

Date: 14 / 4 / 2024



The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

Prof. Dr.  
Idham Ali Abed Khalaf  
Dean of the College of Agriculture

14/4/2024

الأستاذ المساعد الدكتور  
وليد اسماعيل كردي  
مسؤول شعبة ضمان الجودة

2024/4/14

### **1. Program Vision**

Preparing scientifically qualified cadres and opening up to society to transfer modern agricultural technologies and keep pace with global development in the agricultural sector.

### **2. Program Mission**

The main goal of the department's administration is to provide society with resources and staff working in various educational and pedagogical fields, as well as the industrial, banking, security, and economic sectors through:

- 1- Two agricultural engineer teachers graduated with high-level qualifications capable of modernizing the infrastructure in the field of agriculture.
- 2- Developing students, providing them with modern technologies, and providing services to the community and the labor market.
- 3- Building leadership qualities in graduates by training them to work as one team.
- 4- Support and provide a good work environment for students and faculty members.
- 5 - Caring for, supporting and encouraging outstanding students.

### **3. Program Objectives**

1. Preparing graduates with high theoretical and practical skills to meet the needs of industry, technological development and community service in the field of agricultural engineering.
2. Providing the graduates with the applied practical skills and the necessary engineering background according to the scientific developments taking place in the methodological vocabulary and modern teaching methods to

pursue postgraduate studies in the various specializations of agricultural engineering.

3. Preparing graduates to participate actively in building and rebuilding the country and achieving economic and social benefits for society.

#### 4. Program Accreditation

Does the program have program accreditation? And from which agency?

#### 5. Other external influences

Is there a sponsor for the program?

#### 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	7	--	--	main
College Requirements	19			main
Department Requirements	21			main
Summer Training	Yes	--	--	--
Other	--	--	--	--

\* This can include notes whether the course is basic or optional.

## 7. Program Description

### First Year

Course Description	Course Code	Course Name	Class Hours	Units
1st Semester \Core	AH 1910	Principles of the food industry	2	3
1st Semester \Core	AH 1911	Agricultural machinery and equipment	2	3
1st Semester \Core	AH 1912	Plane Surveying	1	3
1st Semester \Core	AH 1913	Mathematics	2	-
1st Semester \Core	AH 1914	General plant	2	3
1st Semester \Core	AH 1915	Computer/ 1		
1st Semester \Core	AH 1916	English Language/1	1	-
1st Semester \Core	AH 1917	Human Rights	1	-
2nd Semester \Core	AH 1910	Principles of field crops	2	3
2nd Semester \Core	AH 1911	Soil principles	2	3
2nd Semester \Core	AH 1912	organic chemistry	2	3
2nd Semester \Core	AH 1913	Principles of animal production	2	3
2nd Semester \Core	AH 1914	Statistics	1	3
2nd Semester \Core	AH 1915	Principles of agricultural economics	2	-
2nd Semester \Core	AH 1916	Engineering Drawing	-	3
2nd Semester \Core	AH 1917	Computers/ 2	-	3

### 2.11 Second Year

Course Description	Course Code	Course Name	Class Hours	Units
1st Semester \Core	AH1920	Crimes of the defunct Baath Party	1	-
1st Semester \Core	AH1921	Principles of microbiology	2	3
1st Semester \Core	AH1922	Organic Agriculture	2	3
1st Semester \Core	AH1923	Landscape design principles	2	3
1st Semester \Core	AH1924	Plant genetics	2	3
1st Semester \Core	AH1925	Horticultural plant insects	1	3
1st Semester \Core	AH1926	Plant nutrition	2	3
1st Semester \Core	AH1927	English language/ 2	1	-
1st Semester \Core	AH1928	Computer 3	-	3
2nd Semester \Core	AH19210	Biochemistry	2	3
2nd Semester \Core	AH19211	Plant Anatomy	2	3
2nd Semester \Core	AH19212	Plant Physiology	2	3
2nd Semester \Core	AH19213	Nurseries and propagation	2	3
2nd Semester \Core	AH19214	Principles of agricultural extension	2	-



2nd Semester \Core	AH19215	Weeds	2	3
2nd Semester \Core	AH19216	Computer/ 4	-	3
2nd Semester \Core	AH19217	Arabic Language	2	-
<b>Third Year 3.11</b>				
Course Description	Course Code	Couse Name	Class Hours	Units
1st Semester \Core	AH1930	Deciduous fruit/ 1	2	3
1st Semester \Core	AH1931	Vegetables production/ 1	2	3
1st Semester \Core	AH1932	Ornamental plants/ 1	1	3
1st Semester \Core	AH1933	Design and analysis of experiments	2	3
1st Semester \Core	AH1934	Plant growth regulators	2	3
1st Semester \Core	AH1935	Irrigation and puncture	2	3
1st Semester \Core	AH1936	Plant environment	2	3
2nd Semester \Core	AH19310	Vegetables production/ 2	2	3
2nd Semester \Core	AH19311	Ornamental plants/ 2	1	3
2nd Semester \Core	AH19312	Apiculture	2	3
2nd Semester \Core	AH19313	Horticultural plant diseases	1	3
2nd Semester \Core	AH19314	Plant breeding	2	3
2nd Semester \Core	AH19315	Medicinal and aromatic plants	2	3
2nd Semester \Core	AH19316	Deciduous fruit/ 2	2	3
2nd Semester \Core	AH19317	English language/ 3	1	-
<b>Fourth Year</b>			<b>4.11</b>	
Course Description	Course Code	Couse Name	Class Hours	Units
1st Semester \Core	AH1940	Plant tissue culture	2	3
1st Semester \Core	AH1941	Evergreen fruit	2	3
1st Semester \Core	AH1942	Vegetable seeds production	2	3
1st Semester \Core	AH1943	Protected agriculture	2	3
1st Semester \Core	AH1944	Landscape engineering	1	3
1st Semester \Core	AH1945	Farm management	1	3
1st Semester \Core	AH1946	Graduation project/1	--	3
2nd Semester \Core	AH19410	Production of grapes and small fruits	2	3
2nd Semester \Core	AH19411	Palm production	2	3
2nd Semester \Core	AH19412	Biotechnology	2	3
2nd Semester \Core	AH19413	Harvesting and storing horticultural crops	2	3
2nd Semester \Core	AH19414	Soil fertility and fertilizers	2	3

2nd Semester \Core	AH19415	English language/ 4	1	-
2nd Semester \Core	AH19416	Graduation project/2	--	3
2st Semester \Core	AH19417	Seminars	1	----

## 8.Expected learning outcomes of the program

### Knowledge:

1. The graduate will have the ability to identify and formulate horticultural problems through familiarization with the basic principles of agricultural sciences such as plant and soil sciences, mathematical sciences, engineering planning, staff management, scheduling, and monitoring to ensure successful project implementation.
2. The graduate possesses knowledge of various irrigation systems and techniques used to save water so that he can design, implement, and control appropriate irrigation systems to ensure sustainable use of water resources.
3. The graduate possesses knowledge of different types of plants, their requirements, and methods of cultivation and maintenance. He can identify plants suitable for specific conditions such as soil, climate, and lighting and can carry out the planting and care operations necessary to promote plant growth and development.
4. The graduate can provide agricultural consultations to institutions and governmental bodies, evaluate surrounding conditions, make recommendations regarding the organization, cultivation, and improvement of plants, and solve problems related to plants, soil, and resource management.
5. The graduate can conduct scientific research in the field of horticulture and garden engineering, develop and improve agricultural technologies, and come up with innovative solutions to the problems facing the agricultural sector.
6. The graduate can manage horticultural projects, including planning resources, managing time and budget, dealing with teams, and coordinating operations.

### Skills :

1. The graduate will have extensive knowledge in plant sciences, including methods of plant cultivation, their water, pedagogical and environmental requirements, and control of plant pests and diseases.
2. The graduate will have skills in designing and planning gardens and coordinating the various elements in the green space, including plants, paths, water bodies, and architectural elements.
3. The graduate will be able to manage horticultural projects, including planning resources, managing time and budget, dealing with teams, and coordinating the process.
4. The graduate will have a good understanding of the technology used in the field of horticulture and landscaping, including advanced irrigation systems, agricultural tools

and equipment, and modern techniques in agriculture such as hydroponics and vertical farming.

5. The graduate will have good communication skills to interact with clients and project workers and provide instructions and recommendations clearly and effectively.
6. The graduate will be familiar with professional standards and practices in horticulture and landscape architecture and must be able to act ethically and responsibly.
7. The graduate will be able to analyze problems related to orchards, vegetable and ornamental plants, as well as gardens and green spaces, and develop practical and innovative solutions.
8. The graduate can also seek continuous development and acquire new skills by participating in training courses and workshops related to the field of horticulture and garden engineering.

**Ethics :**

Preparing engineering designs for agricultural parts and systems.

Analyzing and discussing the results of engineering tests for use in design and evaluation processes.

The ability to write and draft engineering technical reports on the results of scientific examinations and tests.

The ability to extract test results and their effects from the test.

**9. Teaching and Learning Strategies :**

1. Preparing presentations that explain the basic concepts in the field of horticulture and providing detailed lectures on various topics. Use pictures and illustrations to illustrate ideas and concepts better.
2. Organize interactive sessions and workshops that allow participants to participate in the learning process actively. Practical models for growing vegetable plants orchids or designing and landscaping gardens are presented, and participants are encouraged to participate and apply them in practice.
3. Organize field trips to local parks, gardens, nurseries, and farms. Could you explain how to care for and maintain it.
4. Using multimedia, mobile applications, and educational programs to provide information and interact with students.
5. Urging students to participate in practical projects that require the service and care of fruit trees, vegetables, and ornamental plants and guiding and assisting them in choosing appropriate plants, planning the space, and caring for the plants. This enhances practical learning and gives them an opportunity to apply the concepts they have learned.

### 10. Evaluation methods:

- Theoretical semester exams: 20%, practical semester exams (laboratory, field, paper): 20%, theoretical daily exams: 10%
- Final practical test (laboratory, field, paper): 20%, final theoretical test: 30%

### 11. Faculty

#### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor (2)	Horticulture and landscaping gardening	Fruit production	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Production and physiology of sustainable fruit	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Planting and producing deciduous fruit	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Breeding plants in protected environments	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Vegetable seed production	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Vegetable production and nutrition	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Vegetable production and storage	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Breeding horticultural plants	---	---	---	---
Professor (1)	Horticulture and landscaping gardening	Vegetation and fruit nutrition	---	---	---	---
Professor (1)	Agricultural sciences/ field crops	Plant tissue culture	---	---	---	---

Assistant Professor (1)	Horticulture and landscaping gardening	Production and physiology of fruits after harvest	---	---	---	---
Assistant Professor (1)	Horticulture and landscaping gardening	Peas and more fruits	---	---	---	---
Assistant Professor (1)	Horticulture and landscaping gardening	Production of ornamental plants	---	---	---	---
Assistant Professor (1)	Horticulture and landscaping gardening	Garden engineering	---	---	---	---
Assistant Professor (1)	Horticulture and landscaping gardening	Plant environment	---	---	---	---
Assistant Professor (1)	Horticulture and landscaping gardening	Plant tissue culture	---	---	---	---
Assistant Lecture (1)	Horticulture and landscaping gardening	Horticulture and landscaping gardening	---	---	---	---

## Professional Development

### Mentoring new faculty members

1. The department's scientific committee guides new faculty members through:
2. Clarify the vision, mission, and goals that the educational institution seeks to achieve, as well as the policies and standards to which they must adhere.
3. Determine the educational objectives for each course and explain to them the preferred teaching methods and the appropriate methodology to achieve these objectives.
4. Encourage new faculty members to build strong and productive relationships with students. They must be available for students' academic inquiries and needs and assist them in achieving their educational goals.
5. Providing them with support in the field of scientific research and encouraging them to participate in conferences and publishing research in prestigious scientific journals, as well as guiding them in choosing research topics and providing assistance in conducting research and analyzing data.
6. Providing them with opportunities for continuing professional development, whether through internal or external workshops, training programs, or educational courses that encourage them to continue their learning and develop their teaching and research skills.

### Professional development of faculty members

The Department's Scientific Committee, under the direct guidance of the Department Head and the College Dean, has a plan to develop the college through:

1. Paying attention to scientific communication with students, colleagues, and the academic community by organizing lectures, seminars, and workshops and participating in academic events to exchange knowledge and experiences.
2. Promoting professional development through communication and cooperation with local and international companies and research institutions by organizing field visits, exchanging experiences, and cooperating in research and applied projects.
3. Holding annual conferences in cooperation with Iraqi and Arab universities and research institutions with the participation of all faculty members (2021-2022) and (2022-2023).
4. Contributing to conferences in various universities inside and outside Iraq.
5. Contributing to publishing research in local, regional, and international journals (Scopus and Clarivate).
6. Participation in various committees at the university and the ministry.

## **12. Acceptance Criterion**

Central registration is usually carried out by the Ministry of Higher Education based on the degree, professional field, location and university requirements.

## **13. The most important sources of information about the program**

The program initiative came as a result of scientific and technological development in the agricultural field and research on sustainable agriculture and climate change. Through cooperation with universities and research centers, reviewing the reports of the Food and Agriculture Organization of the United Nations, and reviewing modern scientific periodicals and magazines that specialize in the fields of agriculture and agricultural sciences, the need emerged to prepare an academic program. Therefore, the program information is mainly derived from international programs, and the idea of the academic program in Iraq came from the need to develop an educational system that contributes to the qualification and training of Iraqi cadres in various fields and thus keeps pace with development and education in international universities.

## **14. Program Development Plan**

Agricultural technologies are constantly evolving with technological progress in the agricultural field. Here, it was necessary to keep pace with this development, so the need arose to update the curriculum according to the requirements of the labor market by specifying some indicators. These indicators include graduation rates, student evaluations, student performance in tests or final evaluations, Developing essential skills, student participation in academic and community activities, and other relevant factors, or through the use of questionnaires, opinion polls, performance tests, and student evaluations, as well as comparing data between different periods, or between different groups of students, and thus conducting periodic evaluations to examine progress. The program and these evaluations are quarterly or annual.



## Program Skills Outline

Please put (√) in the boxes corresponding to the individual learning outcomes of the evaluated program

Year \ Course			Required learning outcomes of the program															
Course name	Course code	Core or elective	Knowledge and understanding				Subject-specific skills				Thinking skill				General and transferable skills (Or) Other skills related to employability and personal development			
1 <sup>st</sup> Year			A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Principles of the food industry	AH 1910	Core	*															
Agricultural machinery and equipment	AH 1911	Core	*															
Plane Surveying	AH 1912	Core				*				*								
Mathematics	AH 1913	Core																
General plant	AH 1914	Core	*							*								
Computer/ 1	AH 1915	Core								*								



English Language/1	AH 1916	Core	*															
Human Rights	AH 1917	Core																
Principles of field crops	AH 1910	Core	*															
Soil principles	AH 1911	Core																
organic chemistry	AH 1912	Core	*															
Principles of animal production	AH 1913	Core	*															
Statistics	AH 1914	Core	*															
Principles of agricultural economics	AH 1915	Core																
Engineering Drawing	AH 1916	Core	*															
Computers/ 2	AH 1917	Core				*												
2nd Year			<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>D2</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>
Crimes of the defunct Baath Party	AH1920	Core																
Principles of microbiology	AH1921	Core																

Organic Agriculture	AH1922	Core	*																
Landscape design principles	AH1923	Core																	
Plant genetics	AH1924	Core																	
Horticultural plant insects	AH1925	Core	*			*													
Plant nutrition	AH1926	Core	*																
English language/ 2	AH1927	Core			*				*		*								
Computer 3	AH1928	Core																	
Biochemistry	AH19210	Core																	
Plant Anatomy	AH19211	Core																	
Plant Physiology	AH19212	Core		*		*													
Nurseries and propagation	AH19213	Core	*						*										
Principles of agricultural extension	AH19214	Core				*					*								
Weeds	AH19215	Core	*			*													

Computer/ 4	AH19216	Core	*			*												
Arabic Language	AH19217	Core	*															
3 <sup>rd</sup> Year			<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>D2</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>
Deciduous fruit/ 1	AH1930	Core	*															
Vegetables production/ 1	AH1931	Core	*															
Ornamental plants/ 1	AH1932	Core																
Design and analysis of experiments	AH1933	Core	*															
Plant growth regulators	AH1934	Core																
Irrigation and puncture	AH1935	Core		*														
Plant environment	AH1936	Core			*			*										
Vegetables production/ 2	AH19310	Core							*									
Ornamental plants/ 2	AH19311	Core																
Apiculture	AH19312	Core					*											

Horticultural plant diseases	AH19313	Core	*															
Plant breeding	AH19314	Core																
Medicinal and aromatic plants	AH19315	Core																
Deciduous fruit/ 2	AH19316	Core																
English language/ 3	AH19317	Core																
4 <sup>th</sup> Year			<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>D2</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>
Plant tissue culture	AH1940	Core	*							*		*						
Evergreen fruit	AH1941	Core	*					*										
Vegetable seeds production	AH1942	Core										*						
Protected agriculture	AH1943	Core	*															
Landscape engineering	AH1944	Core																
Farm management	AH1945	Core																
Graduation project/1	AH1946	Core																

Production of grapes and small fruits	AH19410	Core	*															
Palm production	AH19411	Core	*			*			*									
Biotechnology	AH19412	Core	*															
Harvesting and storing horticultural crops	AH19413	Core	*		*													
Soil fertility and fertilizers	AH19414	Core						*										
English language/ 4	AH19415	Core	*															
Graduation project/2	AH19416	Core																
Seminars	AH19417	Core																

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

## Course Description Form(The First Stage)

<b>Course Name:</b>					
Principals of Statistics					
Course Code:					
Semester / Year:					
Spring 2024					
Description Preparation Date:					
11 / 2/ 2024					
Available Attendance Forms:					
attendance is according to the weekly lecture schedule					
Number of Credit Hours (Total) / Number of Units (Total)					
30 hours / Units 3.5					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Maath Mohey Mohammed Shareef Email: <a href="mailto:ag.maath.mohey@uoanbar.edu.iq">ag.maath.mohey@uoanbar.edu.iq</a>					
Course Objectives					
<b>Course Objectives:</b>					
- Teach students the importance of statistics.			.....		
- Teaching students about the sciences related to statistics			.....		
. Study statistical symbols and apply them practically.			.....		
4- Study of the graphical representation of agricultural data					
5- Identify measures of central tendency					
6- Study of dispersion metrics					
.					
Teaching and Learning Strategies					
<b>Strategy:</b>					
Follow the lecture method and use modern presentation methods.					
Group dialogues .					
Direct dialogue with students by asking them questions .					
Brainstorming strategy.					
Cooperative education strategy .					
Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	A brief history statistics, relationship of statistics with other sciences	Electronic lectures and practical application laboratories and fields	Questions, discussions and examples

Second	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Understand the type of data and ways to collect and display it	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Statistical variables and symbols	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Data collect and presentation	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Measures of central tendency (arithmetic mean, median, and mode) for both grouped and ungrouped data	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Seventh	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Scales of cen tendency exercises	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Eighth	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Scatterometers	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Ninth	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Applications of measures of central tendency	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Tenth	2	Second month exam			
Eleven	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Principles of probabili theory	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Twelfth	2	1- Computer 2-Modern mobile device 3-Observations at field applications	Potential exercises	Electronic lectu and practi application laboratories a fields	Questions, discussions and examples
Thirteen	2	1- Computer 2-Modern mobile device	Normal distribution of the data	Electronic lectu and practi application	Questions, discussions and examples

		<b>3-Observations at field applications</b>		<b>laboratories and fields</b>	
<b>Fourteenth</b>	<b>2</b>	<b>1- Computer 2-Modern mobile device 3-Observations at field applications</b>	Applications to normal distribution data	<b>Electronic lectures and application laboratories and fields</b>	<b>Questions, discussions and examples</b>
<b>Fifteen</b>	<b>2</b>	<b>Third month exam</b>			
<b>Course Evaluation</b>					
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.					
<b>Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)		Basics of Statistics 2016 Dr. Nazim Younis Abd. Principles of Statistics, Ahmed Abdel Samie, Medical 2008 Principles of statistics. Adnan Ghanem Al-Makhul 200			
Main references (sources)		Recent articles from the Internet and specialized scientific journals			
Recommended books and references (scientific journals, reports...)		History of statistics . 2021 Prof . Khaled Hamed Hassan			
Electronic References, Websites					

<b>Course Name:</b>	
Principles of agricultural economics	
Course Code:	
<b>AH 1915</b>	
Semester / Year:	
Second semester 2024	
Description Preparation Date:	
2024	
Available Attendance Forms:	
regularity (attendance)	
Number of Credit Hours (Total) / Number of Units (Total)	
75 Hour / 3.5 unit	
Course administrator's name (mention all, if more than one name)	
Name: Eyid Abbas Abdalltef Email: <a href="mailto:ag.evid.abbas@uoanbar.edu.iq">ag.evid.abbas@uoanbar.edu.iq</a>	
<b>Course Objectives</b>	
<b>Course Objectives</b>	A- Providing the student with the basic principles of agricultural economics and general economic principles.



	<p>B - Introducing students to the most important economic activities and functions carried out by the agricultural economy.</p> <p>C- Introducing the most important branches and specializations of agricultural economics.</p> <p>D- Introducing the economic and standard criteria and foundations that the agricultural economy relies on in production.</p> <p>E - Introduce the student to the relationship the agricultural economy with other economic productive sectors.</p>
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**Teaching and Learning Strategies**

<b>Strategy</b>	<p>A theoretical clarification of the vocabulary of the subject, using data to understand the scientific subject</p> <p>Using graphs in scientific material, student participation in lectures</p> <p>Conduct daily and monthly tests.</p>
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**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	5	Knowledge and understanding Skill for the subject	Economics, the most important basic branches, and relationship of agricultural economic to it.	theoretically Practical vocabulary Subject	Examination, reporting
2	5	Knowledge and understanding Skill for the subject	The most important branches of agricultural economics and the economic problem and its characteristics.	theoretically Practical vocabulary Subject	Examination, reporting
3	5	Knowledge and understanding Skill for the subject	The role and status agricultural economic activity + aspects of economic life.	theoretically Practical vocabulary Subject	Examination, reporting
4	5	Knowledge and understanding Skill for the subject	Economic resources, invested capital and agricultural costs.	theoretically Practical vocabulary Subject	Examination, reporting
5	5	Knowledge and understanding Skill for the subject	Analysis of agricultural costs + agricultural income.	theoretically Practical vocabulary Subject	Examination, reporting
6	5	Knowledge and understanding Skill for the subject	Economics of agricultural production	theoretically Practical vocabulary	Examination, reporting

			production function and types.	Subject	
7	5	Knowledge and understanding Skill for the subject	Exam	theoretically Practical vocabulary Subject	Examination, reporting
8	5	Knowledge and understanding Skill for the subject	stages of agricultural production	theoretically Practical vocabulary Subject	Examination, reporting
9	5	Knowledge and understanding Skill for the subject	The isoquant curve, properties, and how to draw it.	theoretically Practical vocabulary Subject	Examination, reporting
10	5	Knowledge and understanding Skill for the subject	Replacement or replacement and reaching the lowest cost	theoretically Practical vocabulary Subject	Examination, reporting
11	5	Knowledge and understanding Skill for the subject	Agricultural prices and types of fluctuations.	theoretically Practical vocabulary Subject	Examination, reporting
12	5	Knowledge and understanding Skill for the subject	<b>The demand for agricultural products, concept, factors affecting it, and the demand schedule and curve.</b>	theoretically Practical vocabulary Subject	Examination, reporting
13	5	Knowledge and understanding Skill for the subject	The supply of agricultural products, concept, the factors affecting it, and the supply schedule and curve.	theoretically Practical vocabulary Subject	Examination, reporting
14	5	Knowledge and understanding Skill for the subject	<b>The interaction demand And supply in setting prices.</b>	theoretically Practical vocabulary Subject	Examination, reporting
15	5	Knowledge and understanding Skill for the subject	Exam	theoretically Practical vocabulary Subject	Examination, reporting
<b>Course Evaluation</b>					
Daily exam, submission of reports, semester exam, final exam (total score 100)					
<b>Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)					
Main references (sources)			Principles of agricultural economics –		

	Dr. Abdul Wahab Matar Al-Dahri - College of Agriculture - University of Baghdad - 1998
Recommended books and references (scientific journals, reports...)	* Principles of Agricultural Economics/Dr. Salem Tawfiq Al-Najafi - College of Administration and Economics - University of Mosul 2001. * Principles of agricultural economics_ Dr. Raad Eidan - College of Administration and Economics - Al-Mustansiriya University 2019
Electronic References, Websites	

## Course Description Form(The Second Stage)

<b>Course Name:</b>					
Organic farming					
<b>Course Code:</b>					
AH1922					
<b>Semester / Year:</b>					
Semester					
<b>Description Preparation Date:</b>					
1 / 11/ 2023					
<b>Available Attendance Forms:</b>					
Theoretical material is given 100%. Practical material is given 100%					
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>					
30 hours / Units 3.5					
<b>Course administrator's name (mention all, if more than one name)</b>					
Name: Dr. omar hashim muslah Email: ohmosleh@uoanbar.edu.iq					
<b>Course Objectives</b>					
<b>Course Objectives:</b>		<ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>			
1- Study the importance of science related to organic growth and agriculture					
2- Identify agricultural systems					
3- Knowing the suitable soil for each agricultural crop.					
4- Teaching the student to work in agricultural media					
5- Teaching students sterilization methods					
6- Identify the work of waste					
<b>Teaching and Learning Strategies</b>					
<b>Strategy:</b>					
1- Follow the lecture method and use modern presentation methods.					
2- Conduct laboratory experiments.					
3- Direct dialogue with students by asking them questions.					
4- Homework assignments (writing scientific reports).					
5- Learning through applied laboratory work					
<b>Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Definition and importance of organic agriculture	Electronic lecture and application laboratories fields	Questions, discussions and examples

Second	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Identify areas wh organic agriculture widespread	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Identify the types organic materials a their sources	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Identifying nitrogenous organic compounds	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Nitrogenous orga compounds	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Seventh	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Nitrogenous organic compounds	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Eighth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Decomposition organic compou (cellulose, hemicellulose, star pectin, chitin)	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Ninth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Decomposition organic compou (cellulose, hemicellulose, star pectin, chitin)	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Tenth	2	Second month exam			
Eleven	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Formation of hun and humic a aggregates	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
Twelfth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Within organic mat colloids, soil collo and soil organic mat content	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples

Thirteen	2	1- Computer 2-Modern mobile device 3-Observations and field applications	The role of organic matter in soil fertility, soil rejuvenation activity, and physical characteristics of the soil. The function of nitrogen in plants, the forms of nitrogen in the soil and transformations.(	Electronic lectures and application laboratories fields	Questions, discussions and examples
Fourteenth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Organic soil matter, organic fertilization, and organic agriculture importance, organic agriculture, integrated fertilization	Electronic lectures and application laboratories fields	Questions, discussions and examples
Fifteen	2	Third month exam			
Course Evaluation					
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.					
Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Principle in organic farming Prepared and composed Dr. Muwaffaq Mazban Musalat and Dr. Omar Hashim Musleh 2015		
Main references (sources)			Principles of organic farming Auther 2012 Dr mowafaq M. Muslat and Dr Omar H. Moslh		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

<b>Course Name:</b>
Principles Designing of Gardens
<b>Course Code:</b>
AH1923
<b>Semester / Year:</b>
Autumn(First) / 2023-2024
<b>Description Preparation Date:</b>
08-04-2024
<b>Available Attendance Forms:</b>
Theoretical subject: It is given through the lecture program Practical subject: practical application Field visits Summer Training
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>
30 hours / Theoretical 45 hours / practical Total 75 hours
<b>Course administrator's name (mention all, if more than one name)</b>
Assent. Prof. Dr. Zeyad Mohammed Abdulrazzaq <a href="mailto:zeyadmohammed@uoanbar.edu.iq">zeyadmohammed@uoanbar.edu.iq</a>
<b>Course Objectives</b>
<p>Knowledge of garden design concepts and related scientific, engineering and botanical terminology.</p> <p>Recognize the elements, principles, and rules used in garden design</p> <p>Recognize the importance of landscaping and garden design</p> <p>Learn how to draw 2D gardens and recognize the botanical and industrial symbols used in the design</p> <p>Recognize how to implement garden design</p> <p>The student knows how to start designing gardens according to the scientific stages.</p> <p>The student knows the basic requirements in the garden design process</p> <p>Recognize the garden models and the obstacles faced by each model and how to overcome them</p> <p>Recognize examples of different international, Arab and local garden designs</p> <p>Drawing proposed designs for gardens</p>
<b>Teaching and Learning Strategies</b>
Brainstorming

Thinking strategy according to the student's ability

Critical Thinking is a term that symbolizes the highest level of thinking that aims to pose an issue and then analyze it logically to reach the required solution.

Strategies of presentation, coordination, training, discussion, talking, listening, writing, reading, reading, thinking and reflecting

Cognitive strategies, which are concerned with analyzing the topics to be studied, including naming, explaining, detailing, and organizing.

Metacognitive strategies, which are concerned with managing the learning process, such as selective attention to a specific topic or part of it, monitoring understanding, controlling comprehension, and conducting self-evaluation of what has been learned.

Social or affective strategies that are concerned with students' interaction with the teacher on the one hand and students' interaction with each other on the other hand, such as discussion and dialog with oneself.

These strategies can be achieved through:

Adopting the method of giving theoretical lectures using various modern means of explanation, through which the design systems used in the past and present are recognized in terms of the pros and cons of each design and how to overcome the negatives.

Following the method of practical application through which it aims to:

Introduce the student to how to start designing gardens according to the scientific stages.

The student knows the basic requirements in the garden design process

The student knows how to select and analyze design sites and develop appropriate design proposals for each proposed site, whether private or public gardens or green belts.

Recognize the design programs used to develop proposed designs.

Creating different designs for gardens after selecting different sites, and this is done on A3 paper and then applied on the ground or making miniature models of the proposed designs

Opening the door for discussion to exchange ideas with students, as well as applying the question and answer strategy.

Assigning students homework, writing reports and studies, and conducting field visits.

Conducting daily and monthly theoretical and practical tests.

**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
The first	5	Introduction and Definitions - Terms - Design, designer, garden, outdoor space and more	Principles Designing of Gardens	Explain the lecture and practice using drawing tools (ruler, triangles, pens, regular and grainy papers)	Discuss, ask questions, give examples, and quiz students



Second	5	The relationship of landscape design to other arts and sciences Design elements of gardens and outdoor spaces (line - shape - form - texture - space)	Principles Designing of Gardens	Explain the lecture and practice framing the design board space (A4 and A3) with information key, symbols, scale and north orientation	Discuss, ask questions, give examples, and quiz students
Third	5	Elements of garden design (scale, color, time, light and shadows)	Principles Designing of Gardens	Explain, present the lecture and conduct the practical application of the first exercise - recognizing and drawing all types of lines (straight, oblique, curved).	Discuss, ask questions, give examples, and quiz students
Fourth	5	Foundations and rules for designing gardens and outdoor spaces (simplicity - unity or cohesion - dominance of garden faces and others)	Principles Designing of Gardens	Explain and present the lecture and conduct the practical application of the second exercise - Recognizing the different plant and structural symbols and how to draw them	Discuss, ask questions, give examples, and quiz students
Fifth	5	Basic principles and rules in the design of gardens and outdoor spaces (color predominance - diversity or harmonious repetition - balance - proportion and scale)	Principles Designing of Gardens	Explain and present the lecture and conduct the practical application of the second exercise - Drawing different botanical and structural symbols on the drawing board and how to	Discuss, ask questions, give examples, and quiz students

				distribute them and apply the drawing scale when drawing them.	
Sixth	5	Principles and rules of garden and outdoor space design (Emphasis - Sequence - Expansion)	Principles Designing of Gardens	Explain and present the lecture and conduct the practical application of the third exercise - overlapping lines and symbols to form 2D shapes	Discuss, ask questions, give examples, and quiz students
Seventh	5	Foundations and rules of garden and outdoor space design (axis of design - symmetry and its types - time factor)	Principles Designing of Gardens	Explain the lecture presentation and practical application of the fourth exercise - Recognizing the relationships between different shapes and symbols (overlapping, touching, etc.) and how to draw them.	Discuss, ask questions, give examples, and quiz students
Eighth	5	Factors influencing the design of gardens, in light of which the design idea is developed.	Principles Designing of Gardens	Explanation and presentation of the lecture and practical application of the fifth exercise - Training on the use of different pens in drawing and explaining how to use each type on the drawing board.	Discuss, ask questions, give examples, and quiz students
Ninth	5	Steps to draw the design of gardens and outdoor spaces	Principles Designing	Explanation and presentation of the lecture and	Discuss, ask questions,

			of Gardens	practical application of the sixth exercise - Training on transferring and drawing different garden designs from reality to the drawing board and explaining the mistakes made by the designer and how to avoid them in the future.	give examples, and quiz students
The tenth	5	Steps to implement the design of gardens and outdoor spaces	Principles Designing of Gardens	Explanation and presentation of the lecture and practical application of the seventh exercise - conducting a test for students to draw different gardens depending on the student's imagination in expressing different designs.	Discuss, ask questions, give examples, and quiz students
Eleventh	5	Chronology of garden design (Mesopotamian Gardens - Pharaonic Egyptian Gardens - Persian Gardens)	Principles Designing of Gardens	Explain and present the lecture and conduct the practical application of the eighth exercise - dividing students into groups to compete among them in designing one of the selected gardens at the college site.	Discuss, ask questions, give examples, and quiz students

Twelfth	5	The historical sequence of garden design (Greek Gardens - Roman Gardens - Chinese Gardens - Japanese Gardens)	Principles Designing of Gardens	Explaining and presenting the lecture and presenting the designs of the previous stages to learn how to discuss, analyze, give feedback, etc. and benefit from previous experiences	Discuss, ask questions, give examples, and quiz students
Thirteenth	5	Historical sequence of garden design (Arab Islamic Andalusian Gardens - Mughal Gardens)	Principles Designing of Gardens	Explain and present the lecture and have the students prepare design ideas for each of them (to start the orientation and preparation)	Discuss, ask questions, give examples, and quiz students
Fourteenth	5	Historical sequence of garden design (Italian Gardens - French Gardens)	Principles Designing of Gardens	Explaining and presenting the lecture and presenting the design ideas for discussion in front of colleagues and presenting the design steps and the obstacles they faced	Discuss, ask questions, give examples, and quiz students
Fifteenth	5	Historical Sequence of Garden Design (French Gardens - English Gardens - Modern Gardens)	Principles Designing of Gardens	Explanation and presentation of the lecture and presentation and discussion of all designs	Discuss, ask questions, give examples, and quiz students
<b>Course Evaluation</b>					
Theoretical Tests					
Practical Tests					
Reports and studies					
Field visits					

Learning and Teaching Resources	
<b>Required textbooks (curricular books, if any)</b>	Design and Landscaping, by Abu Dahab Mohammed and Tariq Abu Dahab. Garden Engineering and Design, by Talal Mahmoud Chalabi. Garden Design and Landscaping, by Tarek Mahmoud Al-Qai'i. Foundations of Design, translated by Serop Kendrian Book Garden Design, by Salvia Crowe Book RESIDENTIAL LANDSCAPE ARCHITECTURE, by Norman K.B. & James E.H. Book Time-Saver Standards for Landscape Architecture by Charles H. & Nicholas D. Book Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design, by Norman B. Research and Articles Internet
<b>Main references (sources)</b>	
<b>Recommended books and references (scientific journals, reports)</b>	
<b>Electronic References, Websites</b>	

<b>Course Name:</b>	
Plant genetics	
<b>Course Code:</b>	
<b>Semester / Year:</b>	
Autumn 2024	
<b>Description Preparation Date:</b>	
11 / 2/ 2024	
<b>Available Attendance Forms:</b>	
attendance is according to the weekly lecture schedule	
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>	
30 hours / Units 3.5	
<b>Course administrator's name (mention all, if more than one name)</b>	
Name: Prof. Dr. Maath Mohey Mohammed Shareef Email: <a href="mailto:ag.maath.mohey@uoanbar.edu.iq">ag.maath.mohey@uoanbar.edu.iq</a>	
<b>Course Objectives</b>	
<b>Course Objectives:</b>	.....

<ul style="list-style-type: none"> <li>- Teach students the importance of genetics.</li> <li>- Teaching students about the sciences related to genetics</li> <li>. Study the nature of genetic material .</li> <li>Study of inheritance in plants .</li> <li>Learn about Mendel's laws .</li> <li>Learn about modern technologies in genetics .</li> </ul>	<p>.....</p> <p>.....</p>
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Teaching and Learning Strategies

<p><b>Strategy:</b></p> <p>Follow the lecture method and use modern presentation methods.</p> <p>Group dialogues .</p> <p>Direct dialogue with students by asking them questions</p> <p>Brainstorming strategy.</p> <p>Cooperative education strategy .</p>	
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	A brief history of genetics The relationship genetics to other applied sciences	Electronic and application laboratories fields lectu pract	Questions, discussions and examples
Second	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Plant cell and its components, cell division	Electronic and application laboratories fields lectu pract	Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Introduction to Mendelian inheritance Mendel's first law	Electronic and application laboratories fields lectu pract	Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Mendel's second law and applications horticultural plants	Electronic and application laboratories fields lectu pract	Questions, discussions and examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Deviations from Mendelian laws, genetic interaction	Electronic and application laboratories fields lectu pract	Questions, discussions and examples

Seventh	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Genetic linkage and crossing, genetic map	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Eighth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Hybrid vigor and hybr heterosis	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Ninth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Hybrid vigor and hybr heterosis	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Tenth	2	Second month exam				
Eleven	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Applications of hybrid vigor in the agricultur field	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Twelfth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Genetic engineering and its testing metho	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Thirteen	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Applications of gene engineering in the agricultural field	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Fourteenth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Quantitative genetics	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Fifteen	2	Third month exam				
Course Evaluation						
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.						
Learning and Teaching Resources						
Required textbooks (curricular books, if any)			Genetics 1990 Dr. Abdul Latif Al-Baldawi - Plant genetics and breeding. Ahmed Abdel Mone 2009 . Plant Genetics, Dr. Abdul Basit Al-Musallam 2007 .			

Main references (sources)	Recent articles from the Internet and specialized scientific journals .
Recommended books and references (scientific journals, reports...)	History of Genetics . 2021 Prof . Khaled Hamed Hassan
Electronic References, Websites	

**Course Name: Orchard insects**

Course Code: The second phase

**AH1925**

Semester / Year: autumn 2023 – 2024

Description Preparation Date: 12 \ 4 \ 2024

Available Attendance Forms:

**Lectures**

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

75 Hours 5 Units

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

Name: L.Mohammed Majid Abed

Email: [muhammed.abed@uoanbar.edu.iq](mailto:muhammed.abed@uoanbar.edu.iq)

Course Objectives

**Course Objectives**

Identifying the types of insects that afflict plants grown within orchards whether vegetables or fruits, along with understanding their harmful stages and damage, along with methods of control.

Teaching and Learning Strategies

**Strategy**

Adopting the method of delivering lectures and linking each topic with examples from the actual practice of agriculture, while providing students with simple practical exercises that are discussed and solved during the lecture, with the participation of all students in the class along with the professor to enhance interaction. Additionally, training students in laboratories by conducting necessary laboratory tests for diagnosis.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5 hours	Entomology and its relationship to the Environment.	Environmental Factors Influencing the Presence of Insects.	Lecture	Exam.
2	5 hours	Metamorphosis, and the types of larvae and pupa.	The metamorphosis , knowing the types of larvae and pupae.	Lecture	Exam.
3	5 hours		Identifying the damages insects, economic, Methods Control.	Lecture	Exam.
4				Lecture	Exam.



5	5 hours	Desert locusts , the mole cricket and termite insects.	Identifying of aphids types .	Lecture	Exam.
6	5 hours	Aphids insects and types .	Identifying the damage insects, economic, Methods Control.	Lecture	Exam.
7	5 hours	Palm tree insects.	The important insects that affect citrus, their life cycles, the damages , they cause, and metho control	Lecture	Exam.
8	5 hours	Citrus insects and stem borers .	Identifying vegetable pests, economic, and th damages they cause.	Lecture	Exam.
9	5 hours	Vegetable insects 1, cabbage butterfly and red pumpkin beetle .	Identifying the scientific and common names , modes of damage, methods control.	Lecture	Exam.
10	5 hours	Cabbage webworm and Diamondback moth.	Identifying the damage insects, economic, Methods Control.	Lecture	Exam.
11	5 hours	Vegetable insects 2, melon fly, Small Cucurbit Fly.	Identifying the damage insects, economic, methods of control.	Lecture	Exam.
12	5 hours	black cutworm, whitefly and gastropod	Identifying the scientific and common names , modes of damage, methods control	Lecture	Exam.
13	5 hours	Vegetable insects 3, bollworm and potato tuber moth .	The importance insect, life cycle, damages it causes, and methods of control	Lecture	Exam.
14	5 hours	Eggplant stem borer, onion thrips.	Identifying vegetable pests, economic, and th damages they cause.	Lecture	Exam.
15	5 hours	Carob moth , Moth Cydia and Fig-Tree Moth.	Identifying the damage insects, economic, Methods Control. The importance insect, life cycle, damages it causes,	Lecture	Exam.

	<b>Fig fruit fly, olive leaf fly.</b>	<b>and methods of control</b>	
	<b>Grape leafhopper , Hawk Moth and cicada.</b>		
<b>Course Evaluation</b>			
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			
<b>Learning and Teaching Resources</b>			
Required textbooks (curriculum books, if any)	Pests of Orchards" by Dr. Iyad Youssef Al-Haj Ismail and Banna Rakan Dabdoub. Published in 2008 by the Ministry of Higher Education and Scientific Research, Mosul University, 2010.		
Main references (sources)	Pests of Orchards" by Salem Jameel Jergis and Dr. Mohammed Abd Karim Mohammed. Published in 1992 by the Ministry of Higher Education and Scientific Research, Mosul University, College of Agriculture and Forestry.		
Recommended books and references (scientific journals, reports...)	Pests of Fruit Crops A Colour Handbook, Second Edition By Alford , Copyriht . 2014. David V.		
Electronic References, Websites	<a href="https://link.springer.com/book/10.1007/978-3-662-07913-3">https://link.springer.com/book/10.1007/978-3-662-07913-3</a>		

<b>Course Name:</b>	
Plant Nutrition advance	
<b>Course Code:</b>	
<b>AH1926</b>	
<b>Semester / Year:</b>	
Spring 2023-2024	
<b>Description Preparation Date:</b>	
2024/4/17	
<b>Available Attendance Forms:</b>	
Theoretical material is given 100% in person. Practical material is given 100% in person.	
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>	
30 hours / units 3.5	
<b>Course administrator's name (mention all, if more than one name)</b>	
Name: Dr. omar hashim muslah Email: <a href="mailto:ohmosleh@uoanbar.edu.iq">ohmosleh@uoanbar.edu.iq</a>	
<b>Course Objectives</b>	
<b>Course Objectives</b>	.....
Studying the various nutritional factors affecting growth and yield formation	.....
Learn about ways to divide nutrients	.....

Knowing the appropriate soil for each agricultural crop Knowing the harms and benefits of nutrients. Learn about ways to feed horticultural plants. Identify the nutritional needs of plants	
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**Teaching and Learning Strategies**

<b>Strategy</b>	1- Follow the lecture method and use modern presentation methods. 2- Conduct field experiments of the media. 3- Direct dialogue with students by asking them questions. 4- Homework assignments (writing scientific reports). 5- Learning through applied field work.
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**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
The first	5	the computer A modern mobile device Observations and field	applications Introduction to plant nutrition	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Second	5	the computer A modern mobile device Observations and field	applications Soil as a medium for plant growth and the readiness of nutrients	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Third	5	the computer A modern mobile device Observations and field	lectures and practical application in laboratories and fields	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Fourth	5	the computer A modern mobile device Observations and field	applications Nutrient absorption (ionic absorption and its theories	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Fifth	5	the computer A modern mobile device Observations and field	First Exam	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Sixth	5	the computer A modern mobile device Observations and field	applications of water, plant nutrition and water physiological need	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples

seventh	5	the computer A modern mobile device Observations and field	Plant nutrition and the amount of yield (the relationship of the plant to the yield	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Eighth	5	the computer A modern mobile device Observations and field	Plant nutrition, diseases and insect resistance	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
	5	the computer A modern mobile device Observations and field	Plant nutrition, diseases and insect resistance	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
ninth	5	the computer A modern mobile device Observations and field	Soil salinity and plant nutrition	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
The tenth	5	the computer A modern mobile device Observations and field	Second exam	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
eleventh	5	the computer A modern mobile device Observations and field	Pollution and plant nutrition	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
twelveth	5	the computer A modern mobile device Observations and field	Food crops and their role in plant nutrition	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples
Thirteenth	5	the computer A modern mobile device Observations and field	Organic soil, organic fertilization and organic farming: importance, organic farming and integrative fertilization And the role of organic farming in sustainable agriculture	electronic lecture and practical application in laboratories and fields	Questions, discussions and examples

**Course Evaluation**

- 1- Monthly exams.
- 2- Rapid exams (Quazat).

- 3- Evaluation through classroom activity.
- 4- By preparing scientific reports and taking advantage of information networks.
- 5- Final exams.

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fertility and plant nutrition / Al-Qarwani, Mohieddin 1979 Plant nutrition / Al-Rais, Abdul Hadi Jawad 1988 Applied plant nutrition / Al-Sahhaf, Fadel Hussein 1989 Theoretical and practical plant nutrition (Muzaffar Ahmed Daoud Al-Mousili et al.) 2019
Main references (sources)	Fertility and plant nutrition / Al-Qarwani, Mohieddin 1979 Plant nutrition / Al-Rais, Abdul Hadi Jawad 1988 Applied plant nutrition / Al-Sahhaf, Fadel Hussein 1989 Theoretical and practical plant nutrition (Muzaffar Ahmed Daoud Al-Mousili et al.) 2019
Recommended books and references (scientific journals, reports...)	Mineral Nutrition and Plant Disease null by <u>Lawrence E. Datnoff</u> (Author, Editor), <u>Wade H. Elmer</u> (Editor), <u>Don M. Hube</u> 2007
Electronic References, Websites	

<b>Course Name:</b>	Anatomy of a plant
Course Code:	AH19211
Semester / Year:	2nd / spring
Description Preparation Date:	8 / 4/ 2024
Available Attendance Forms:	attendance is according to the lecture schedule
Number of Credit Hours (Total) / Number of Units (Total)	70 hours / Units 3.5
Course administrator's name (mention all, if more than one name)	Name: prof. Dr. Saad A. Mahmood Email: <a href="mailto:saad.abd@uoanbar.edu.iq">saad.abd@uoanbar.edu.iq</a>
Course Objectives	
<b>The ability to understand the basis of plant anatomy</b>	..... ..... .....

<p style="text-align: center;"><b>Increasing the skills of primary school students in using modern techniques available in plant anatomy</b></p> <p><b>3- The ability of students to use these skills implementing and preparing anatomical sections plant tissues</b></p>	
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**Teaching and Learning Strategies**

<p><b>Follow the lecture method and use modern presentation methods.</b></p> <p><b>Direct dialogue with students by asking them questions.</b></p> <p><b>Practical lessons in the plant anatomy laboratory and how to use the available techniques of dissection tools and types of microscopes available.</b></p> <p><b>Learning through implementing anatomical sections</b></p>	
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**Course Structure**

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
<b>First</b>	<b>5</b>	Understand and comprehend the basics of plant anatomy and related sciences	Introduction to plant anatomy	With modern display devices	<b>Questions, discussions and examples</b>
<b>Second</b>	<b>5</b>	The ability to understand the components of the plant cell and the components of the cell wall	Plant cell and cell wall	With modern display devices	<b>Questions, discussions and examples</b>
<b>Third</b>	<b>5</b>	Understanding and explaining the living organs of the plant cell	Living components of a plant cell	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Fourth</b>	<b>5</b>	Understand and explain	Non-living components	With modern	<b>Questions, discussions</b>

		the non-living components of the plant cell	of the plant cell	display devices	<b>and examples</b>
<b>Fifth</b>	<b>2</b>		First month exam		
<b>Sixth</b>	<b>5</b>	Understanding and studying the components and properties of meristematic tissues	Meristematic tissue	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Seventh</b>	<b>5</b>	Understanding and studying the components and properties of permanent tissues	Permanent tissues	White board	<b>Questions, discussions and examples</b>
<b>Eighth</b>	<b>5</b>	Understanding and studying the connective tissue system: the skin	Cellular diversity in the connective tissue system: the epidermis	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Ninth</b>	<b>5</b>	Understanding and studying the connective tissue system: stomatal complexes	Cellular diversity in the connective tissue system: stomatal complexes	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Tenth</b>	<b>2</b>		Second month exam		
<b>Eleven</b>	<b>5</b>	Understanding and studying the basic system: parenchymal tissue	Basic system: parenchymal tissue	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Twelfth</b>	<b>5</b>	Understanding and studying the basic	Basic system: collenchyma tissue	With modern display	<b>Questions, discussions</b>

		system: the collagenous tissue		devices, tools and laboratory equipment	<b>and examples</b>
<b>Thirteen</b>	<b>5</b>	Understanding and studying the basic system: the collagenous tissue	Basic system: sclerenchyma (fibers)	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Fourteenth</b>	<b>5</b>	Understanding and studying the basic system: sclerenchyma	Main system: sclerenchyma (scleridoids)	With modern display devices, tools and laboratory equipment	<b>Questions, discussions and examples</b>
<b>Fifteen</b>	<b>2</b>	<b>Third month exam</b>			

#### Course Evaluation

Monthly exams.  
Rapid exams (Quazat).  
Evaluation through classroom activity  
Through writing reports and laboratory activities  
5- Final exams.

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Basics of plant anatomy Dr. Badri Awaid Al-Ani Dr. Qaiser Naguib Saleh 2- Plant anatomy lectures available on website
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

<b>Course Name:</b>	<b>Plant Physiology</b>
<b>Course Code:</b>	AH19212
<b>Semester / Year:</b>	Spring (Second) / 2023-2024
<b>Description Preparation Date:</b>	08-04-2024



<b>Available Attendance Forms:</b>
Theoretical subject: It is given through the lecture program Practical subject: practical application Field visits Summer Training
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>
30 hours / Theoretical 45 hours / practical Total 75 hours
<b>Course administrator's name (mention all, if more than one name)</b>
<p><b>Prof. Dr. Rasmi Mohammed Hamad</b> <a href="mailto:ag.rassme.mohammed@uoanbar.edu.iq">ag.rassme.mohammed@uoanbar.edu.iq</a></p> <p><b>Dr. Idrees Hussein Mola Salih Mohammed</b> <a href="mailto:idresshussein@uoanbar.edu.iq">idresshussein@uoanbar.edu.iq</a></p> <p><b>Dr. Noor Taha Abd</b> <a href="mailto:Noor.taha@uoanbar.edu.iq">Noor.taha@uoanbar.edu.iq</a></p>
<b>Course Objectives</b>
<p>Learn about plant physiology</p> <p>The study of the plant cell, its components and their respective functions</p> <p>Recognize water relations (diffusion, osmosis, osmosis, permeability)</p> <p>Recognize the mechanism of absorption and transport of water and salts through the plant</p> <p>Study transpiration, its types and benefits to the plant</p> <p>Study respiration and its types and benefits to the plant</p> <p>Recognize photosynthesis and the mechanism of its occurrence in the plant and its importance to the plant</p>
<b>Teaching and Learning Strategies</b>
<p>Brainstorming</p> <p>Thinking strategy according to the student's ability</p> <p>Critical Thinking is a term that symbolizes the highest level of thinking that aims to pose an issue and then analyze it logically to reach the required solution.</p> <p>Strategies of presentation, coordination, training, discussion, talking, listening, writing, reading, reading, thinking and reflecting</p> <p>Cognitive strategies, which are concerned with analyzing the topics to be studied, including naming, explaining, detailing, and organizing.</p> <p>Metacognitive strategies, which are concerned with managing the learning process, such as selective attention to a specific topic or part of it, monitoring understanding, controlling comprehension, and conducting self-evaluation of what has been learned.</p> <p>Social or affective strategies that are concerned with students' interaction with the teacher on the one hand and students' interaction with each other on the other hand, such as discussion and dialog with oneself.</p> <p>These strategies can be achieved through:</p> <p style="padding-left: 40px;">Adopting the method of giving theoretical lectures using various modern means of explanation, through which the design systems used in the past and present are</p>

recognized in terms of the pros and cons of each design and how to overcome the negatives.  
 Following the method of practical application.  
 Opening the door for discussion to exchange ideas with students, as well as applying the question and answer strategy.  
 Assigning students homework, writing reports and studies, and conducting field visits.  
 Conducting daily and monthly theoretical and practical tests.

**Course Structure**

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first	5	Plant-Water Relationship: Physical and chemical properties, functions and functions of water in plants	Plant Physiology	Explain, present the lecture and conduct the scientific application to Studying the plant cell using a microscope	Discuss, ask questions, give examples, and quiz students
Second	5	Diffusion and osmosis: plant cells and diffusion, types of membranes according to their composition and permeability, factors affecting the plasma membrane	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring diffusion	Discuss, ask questions, give examples, and quiz students
Third	5	Diffusion and osmosis: plant cells and diffusion, types of membranes according to their composition and permeability, factors affecting the plasma membrane	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring plasmodesmata	Discuss, ask questions, give examples, and quiz students
Fourth	5	Chemical potential of water, aqueous potential, osmotic potential	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring imbibition	Discuss, ask questions, give examples, and quiz students
Fifth	5	Factors affecting osmotic potential, types of solutions for the cell, osmotic	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on	Discuss, ask questions, give examples,

		pressure, wall pressure		measuring transpiration	and quiz students
Sixth	5	Examples and applications of the plant cell, water potential and its components	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring the movement and transport of water	Discuss, ask questions, give examples, and quiz students
Seventh	5	Plasmodesmata, impregnation	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring the movement and transport of mineral elements	Discuss, ask questions, give examples, and quiz students
Eighth	5	Mechanism of water uptake, water uptake from soil, movement and transport of water within the plant	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring the transport of processed foodstuffs (carbohydrates)	Discuss, ask questions, give examples, and quiz students
Ninth	5	Water transport through plasma channels, free transport of water, bleeding and guttation	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring the transport of processed food (carbohydrates)	Discuss, ask questions, give examples, and quiz students
The tenth	5	Transpiration: Its importance, types of transpiration, hypotheses of the mechanics of water transport from bottom to top	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on measuring respiration	Discuss, ask questions, give examples, and quiz students
Eleventh	5	Mechanism of stomatal closure and opening	Plant Physiology	Explain, present the lecture and conduct the scientific application to	Discuss, ask questions, give examples,

				Respiration experiments	and quiz students
Twelfth	5	Respiration	Plant Physiology	Explain, present the lecture and conduct the scientific application to Photosynthesis experiments	Discuss, ask questions, give examples, and quiz students
Thirteenth	5	Respiration	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments on photosynthesis	Discuss, ask questions, give examples, and quiz students
Fourteenth	5	Photosynthesis	Plant Physiology	Explain, present the lecture and conduct the scientific application to Dormancy and germination experiments	Discuss, ask questions, give examples, and quiz students
Fifteenth	5	Photosynthesis	Plant Physiology	Explain, present the lecture and conduct the scientific application to Experiments in Dormancy and Germination	Discuss, ask questions, give examples, and quiz students
<b>Course Evaluation</b>					
Theoretical Tests					
Practical Tests					
Reports and studies					
Field visits					
<b>Learning and Teaching Resources</b>					
<b>Required textbooks (curricular books, if any)</b>			Books Plant Physiology, by Lincoln & Zeiger Book Fundamentals of Plant Physiology, by Bassam Taha Book Plant Physiology, by Emad El Din Wasfi Book Plant Physiology, by Heshmat El-Desouki and Abeer El-Hakim		
<b>Main references (sources)</b>					
<b>Recommended books and references (scientific journals, reports)</b>					

<b>Electronic References, Websites</b>	Book Fundamentals of Practical Plant Physiology, by Heshmat El-Desouki and Abeer El-Hakim Research & Articles Internet
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<b>Course Name:</b>					
The Nurseries and Plant Propagation					
<b>Course Code:</b>					
AH19213					
<b>Semester / Year:</b>					
Spring / 2024					
<b>Description Preparation Date:</b>					
2024/2/10					
<b>Available Attendance Forms:</b>					
It is given in the presence of the students					
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>					
75 hours / 3.5 units					
<b>Course administrator's name (mention all, if more than one name)</b>					
Name: Assist. Prof. Dr. Atheer Mohammed Ismail Email: <a href="mailto:ag.atheer.mohammed@uoanabr.edu.iq">ag.atheer.mohammed@uoanabr.edu.iq</a>					
<b>Course Objectives</b>					
<b>Course Objectives</b>			<p>1- Introducing the student to the basics of global plants propagation and the facility for propagation of plants in greenhouses, glass houses, cold and heated beds, and others.</p> <p>2 - Introducing the student to the basics of global plant propagation and plant propagation facility.</p> <p>3 - A brief history of the initiation and evolution of plant propagation.</p> <p>4 - Introduce the student to the methods of vegetative propagation of plants and the cellular foundation of seeds propagation.</p>		
<b>Teaching and Learning Strategies</b>					
<b>Strategy</b>		<p>1- Follow the lecture style with the use of modern means of presentation.</p> <p>2- Conducting laboratory experiments.</p> <p>3- Direct dialogue with students by asking them questions.</p> <p>4- Homework (writing scientific reports).</p> <p>5- Learning through applied field practices.</p>			
<b>Course Structure</b>					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>

<b>The first</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> The evolution of plant propagation in human society, Sexual propagation by seeds Seed development, Matured seeds, Apomixis phenomena Types of apomixes, Polyembryony <b>Practical:</b> Nursery, Types of nurseries, Requirements that must be fulfilled to establish a nursery	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Second</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> Seed dormancy, The advantages of seed dormancy, Seed dormancy causes (Seed coats hardness, Inhibitors in seed coverings or in embryo) The embryo is not fully developed, Requirement for therapy at specific temperatures Stages of dormancy, Types of dormancy <b>Practical:</b> Nursery facilities (Span houses, Lathhouses, Greenhouses, Cold beds, Hot beds), Agricultural media used in plant propagation (Sand, Peat, Peat moss, Sphagnum moss, Sawdust and bark, Vermiculite, Perlite)	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Third</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer	<b>Theoretical:</b> Seed germination,	Theoretical lectures	Questions, discussions

		<p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p>Stages of seed germination, Environmental factors influencing the germination of seeds</p> <p><b>Practical:</b> Treatments that stimulate seed germination (Scarification, Stratification, Soak the seeds in water, Treat seeds with plant growth regulators)</p>	<p>and practical application laboratories and fields.</p>	<p>and examples</p>
<b>Fourth</b>	5 hr.	<p><b>1-</b> Lectures</p> <p><b>2-</b> the computer</p> <p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p><b>Theoretical:</b> Asexual propagation (Vegetative propagation), Cellular foundations of vegetative propagation</p> <p>Reasons for using vegetative propagation, The cloning</p> <p>Genetic variations in vegetatively propagated plants (Mutations, Chimera, Bud sports)</p> <p><b>Practical:</b> Seeds extraction, Methods of cultivation seeds</p>	<p>Theoretical lectures and practical application laboratories and fields.</p>	<p>Questions, discussions and examples</p>
<b>Fifth</b>	5 hr.	<p><b>1-</b> Lectures</p> <p><b>2-</b> the computer</p> <p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p><b>Exam</b></p>	<p>Theoretical lectures and practical application laboratories and fields.</p>	<p>Questions, discussions and examples</p>
<b>Sixth</b>	5 hr.	<p><b>1-</b> Lectures</p> <p><b>2-</b> the computer</p> <p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p><b>Theoretical:</b> Vegetative propagation by cuttings</p> <p>Conditions that must be met for propagating by cuttings, Advantages of propagation by cuttings</p> <p>Kinds of cuttings, The cellular and anatomical foundations of adventitious roots formation</p> <p><b>Practical:</b> Transactions that encourage the</p>	<p>Theoretical lectures and practical application laboratories and fields.</p>	<p>Questions, discussions and examples</p>

			formation of adventitious roots on cuttings		
<b>Seventh</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> Factors affecting the formation of adventitious roots, Internal plant-related factors, Therapies that will enhance the root plant's physiological status, (Etiolation, Girdling, Wounding), Environment-related external factors <b>Practical:</b> Prepare the cuttings, Practical applications for propagation by cutting Preparing plant growth regulators solutions for treating cuttings	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Eighth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> The theoretical foundation of budding and grafting Propagation purposes by budding and grafting <b>Practical:</b> Seedlings individualization, Seedlings acclimatization, Transporting and cultivation seedlings in permanent location	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Ninth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> Bud union formation, Steps union of the shield budding process, Compatibility and incompatibility, T mutual effects between rootstock and scion <b>Practical:</b> Methods of propagation by budding	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Tenth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and	<b>Theoretical:</b> Preparing bud sticks, The characteristics of the rootstocks utilized in budding process, the	Theoretical lectures and practical	Questions, discussions and examples



		field application	height of budding region, Budding procedure dates <b>Practical:</b> Methods of propagation by budding	application laboratories and fields.	
<b>Eleventh</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Exam</b>	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Twelfth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> Grafting, The cellular and anatomical foundation of grafting, Advantages and disadvantages of propagation by grafting Selection and storage of the graft budsticks <b>Practical:</b> Methods of propagation by grafting	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Thirteenth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> Layering Advantages of layering Factors affecting the success of propagation by layering, Simple layering <b>Practical:</b> Methods of propagation by layering	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Fourteenth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> Vegetative propagation by specialized parts, Bulbs, Corms, Tubers, Rhizomes, Offsets <b>Practical:</b> Plant modifications suitable for natural propagation (Runners, Stolens, Offsets, Suckers, Crown division)	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Fifteenth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> The foundations of plant propagation through plant tissue culture, Plant tissue culture	Theoretical lectures and practical	Questions, discussions and examples

			propagation stages, Advantages and disadvantages of propagation by plant tissue culture, Acclimatization methods of plants resulting from plant tissue culture <b>Practical:</b> Visiting the laboratory of plant tissue culture, Foundations for establishing plant tissue culture laboratories, Learn how to prepare the propagation and development media used with plant tissue culture technology	application laboratories and fields.	
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**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.

**Learning and Teaching Resources**

Required textbooks (curricular books, if any)	Salman, M. A. 1988. Propagation of Horticultural Plants. Ministry of Higher Education and Scientific Research- University of Baghdad- Iraq
Main references (sources)	Hartmann, H. T., D. E. Kester, F. T. Davies and R. Geneva. 2010. Plant propagation. Principles and practices. 8 <sup>th</sup> . Ed. Prentice Hall, Englewood Cliffs. New Jersey.
Recommended books and references (scientific journals, reports...)	Muhammad, S. 1998. Plant propagation its Art and Science. Maktaba Imdadai Mph: Jangi Qissa Khawani Peshawar.
Electronic References, Websites	

<b>Course Name:</b>
Agricultural Extension
<b>Course Code:</b>
AH19214
<b>Semester / Year:</b>
Spring2023-2024

Description Preparation Date:
2024/2/11
Available Attendance Forms:
My attendance is according to the lecture schedule
Number of Credit Hours (Total) / Number of Units (Total)
30 hour
Course administrator's name (mention all, if more than one name)
Name: Dr. Mukhalad Hadi Ismali Email: <a href="mailto:mhalani@uoanbar.edu.iq">mhalani@uoanbar.edu.iq</a>

**Course Objectives**

<b>Course Objectives</b>	.....
1- Extension to know agricultural extension, through the definition and philosophy of agricultural extension.	.....
2- Clarifying the objectives of agricultural extension, the role of agricultural extension in educating farmers and peasants.	.....
3- The role of agricultural extension in rural development, and explanation of the position of agricultural extension among agricultural sciences.	
4- Showing agricultural extension systems and linking them to the principle of organization and the functions of the administrative organization of agricultural extension.	
5- Agricultural extension organization in Iraq and communication, elements of communication, adoption	
6- Roads and agricultural extension aids.	

**Teaching and Learning Strategies**

<b>Strategy</b>	
1- Follow the lecture method and use modern presentation methods	
2- Direct dialogue with students by asking them questions	
3- Homework (writing scientific reports)	

**Course Structure**

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1- Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First	2	A Historical overview of agricultural extension	Grapes and their economic importance and nutritional value	Electronic lectures and practical application	Questions, discussions and examples
Second	2	Definition of	Grape classification	Electronic lectures and	Questions, discussions and examples

		agricultural extension		practical application			
Third	2	The relationship between scientific research and extension agencies	Preparing a nursery for the propagation of grapes in various ways	Electronic lectures and practical application	Questions, discussions and examples		
Fourth	2	Agricultural extension philosophy	Suitable environment for farming	Electronic lectures and practical application	Questions, discussions and examples		
Fifth	2	Behavioral changes targeted by counseling First month exam					
Sixth	2	Principles of agricultural extension	The phenotypic structure of the grape tree	Electronic lectures and practical application	Questions, discussions and examples		
Seventh	2	Objectives of agricultural extension Agricultural extension agency	Annual cycle of grape vine growth	Electronic lectures and practical application	Questions, discussions and examples		
Eighth	2	Agricultural extension agency	Grape propagation	Electronic lectures and practical application	Questions, discussions and examples		
Ninth	2	Extension training	Breeding and pruning grapes	Electronic lectures and practical application	Questions, discussions and examples		
Tenth	2	Second month exam					
Eleven	2	Extension leadership	Study of the small fruits (strawberry, raspberry, blackberry, blueberry, currant, cosberry, cranberry) in terms of their	Electronic lectures and practical application	Questions, discussions and examples		

			importance and the appropriate environment for them, their propagation, cultivation and service processes						
Twelfth	2	Extension Adoption	Methods of cultivation and production of strawberry, raspberry, blackberry, currant, blueberry, cranberry and service and harvest operations	Electronic lectures and practical application	disc				
Thirteen	2	Extension planning	Growing grapes on the slopes in northern Iraq	Electronic lectures and practical application i	disc				
Fourteenth	2	Extension methods	Some agricultural service operations for grapes	Electronic lectures and practical application	disc				
Fifteen	2	Evaluation of extension programs							
Course Evaluation									
1- Monthly tests 2- Rapid tests (COUZ) 3- Evaluation of classroom activity 4- Preparing scientific reports 5- Final exams									
Learning and Teaching Resources									
Required textbooks (curricular books, if any)				Al-Samarrai, Hatem 0972Agricultural extension and its role in rural development Press Al-Zaman, Baghdad.					

Main references (sources)	Addison H. Mander, translated Abbas Abdel Mohsen Al Khaf 0983 Agricultural extension, C, OC, 6 University of Basra.
Recommended books and references (scientific journals, reports...)	Recent articles from the Inter and from specialized scient journals and the Science Magaz Al-Zariyah - Iraqi virtual library
Electronic References, Websites	

<b>Course Name: weed control</b>	
Course Code:	
<b>AH19215</b>	
Semester / Year: second	
Description Preparation Date: 2024-4-14	
Available Attendance Forms: in person	
Number of Credit Hours (Total) / Number of Units (Total)	
30 Theoretical Hours + 45 Practical Hours 3 units	
Course administrator's name (mention all, if more than one name)	
Name: Dr. yas amen mohammed Email: ag.yass.ameen@uoanbar.edu.iq	
<b>Course Objectives</b>	
A - Expanding the students' theoretical and practical perceptions regarding weed control. B – Study the description of weed and its characteristics related to the weed biology. C - Identify the damages of weed to agricultural production and the ecosystem. d - Getting acquainted with the methods of combating weed and the modern technologies used in this field.	
<b>Teaching and Learning Strategies</b>	
<b>Strategy</b>	-Increasing students' awareness of modern trends in managing and protecting pastures. -Using Power Point presentation methods to convey information well and clearly to the student And Urging students to take advantage of Google search engines while asking them to submit scientific reports on the topics given to them in the academic subject. - Semester and final exams are considered a reflection of the student's commitment and cognitive and skill achievement.
<b>Course Structure</b>	

### Course Description Form(The Third Stage)

<b>Course Name:</b>	
Deciduous fruits1	
Course Code:	
AH1930	
Semester / Year:	
Semester	
Description Preparation Date:	
15/ 1/ 2024	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
30 hours / Units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Sameer abed ali Email: sameer.abed@uoanbar.edu.iq Name: Gaith Ibrahim abed Email:Gaith 882020@ uoanbar.edu.iq	
Course Objectives	
<b>Course Objectives:</b>	
1- Identifying the most important strategic deciduous fruit varieties growing in the conditions of Iraq	.....
2- Identify the appropriate environmental conditions for the growth of deciduous fruits	.....
3- Learn about the most important ways to reproduce grapes	.....
4- Learn about the most important methods of pruning and breeding deciduous fruits	
Teaching and Learning Strategies	
<b>Strategy</b>	1- Through lectures. 2- Direct meeting with students (conversations). 3- Scientific trips to different agricultural work sites. 4- Hosting specialized professors to increase the scientific level of students.

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Economical importance for fruit tree	Electronic lectures practical application laboratories fields	Questions, discussions examples
Second	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Factors effecting on fruit growth and production	Electronic lectures practical application laboratories fields	Questions, discussions examples
Third	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Methods of fruit propagation	Electronic lectures practical application laboratories fields	Questions, discussions examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Stock for fruit trees	Electronic lectures practical application laboratories fields	Questions, discussions examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Classification of fruit trees	Electronic lectures practical application laboratories fields	Questions, discussions examples
Seventh	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Dormancey and rest period	Electronic lectures practical application laboratories fields	Questions, discussions examples
Eighth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Bud development	Electronic lectures practical application	Questions, discussions examples



				laboratories fields	
<b>Ninth</b>	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Pollination and fertilization	Electronic lectures practical application laboratories fields	Questions, discussions examples
<b>Tenth</b>	2	<b>Second month exam</b>			
<b>Eleven</b>	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Sterility and Incompatibility	Electronic lectures practical application laboratories fields	Questions, discussions examples
<b>Twelfth</b>	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Fruit set and development	Electronic lectures practical application laboratories fields	Questions, discussions examples
<b>Thirteen</b>	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Fruit thinning (perpure, kinds, methods)	Electronic lectures practical application laboratories fields	Questions, discussions examples
<b>Fourteenth</b>	2	1- Computer 2-Modern mobile device 3-Observations and field applications	flower and fruit abscission	Electronic lectures practical application laboratories fields	Questions, discussions examples
<b>Fifteen</b>	2	<b>Third month exam</b>			
<b>Course Evaluation</b>					
1- Monthly exams. 2- Rapid Exams . 3- Evaluation through class activity. 4- By preparing scientific reports and making use of information networks. 5- final exams.					
<b>Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)			1- Deciduous fruit production 1 1980. Jabbar Hassan Al-Nuaimi. Albasrah university. 2- Deciduous fruit production 2 1980. Jabbar Hassan Al-Nuaimi. Albasrah university.		

Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

<b>Course Name:</b>	
<b>Winter vegetable production</b>	
Course Code:	
AH1931	
Semester / Year:	
Semester	
Description Preparation Date:	
1 / 11/ 2023	
Available Attendance Forms:	
Theoretical material is given 100%. Practical material is given 100%	
Number of Credit Hours (Total) / Number of Units (Total)	
30 hours / Units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Dr. omar hashim muslah Email: ohmosleh@uoanbar.edu.iq	
Course Objectives	
<b>Course Objectives:</b>	.....
1 Studying the various environmental factors affecting growth and yield formation	.....
2- Learn about the methods of classifying vegetable crops.	.....
3- Knowing the appropriate soil for each of agricultural crops	
4- - Knowing the damages of temperature and intensity of lighting to crops	
Teaching and Learning Strategies	
<b>Strategy:</b>	
1- Follow the lecture method and use modern presentation methods.	
2- Conduct laboratory experiments.	
3- Direct dialogue with students by asking them questions.	

4- Homework assignments (writing scientific reports).  
5- Learning through applied laboratory work

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Introduction vegetable crops and problems that hinder vegetable production the world and Iraq	Electronic and application laboratories fields	lectu pract a Questions, discussions and examples
Second	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Methods of classify vegetable crops and their divisions	Electronic and application laboratories fields	lectu pract a Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Environmental factors including heat, light, humidity, weather and soil factors	Electronic and application laboratories fields	lectu pract a Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Irrigation and Fertilization	Electronic and application laboratories fields	lectu pract a Questions, discussions and examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Seedling production and acclimatization.	Electronic and application laboratories fields	lectu pract a Questions, discussions and examples
Seventh	2	1- Computer 2-Modern mobile device 3-Observations and field applications	A study of vegetables belonging to the Crusader family, including (Lahana, Kalim, Shalgam, Radish, Cauliflower and Rashad) in terms of the original habitat, nutritional importance, growth factors, flowers, yield, pests and varieties.	Electronic and application laboratories fields	lectu pract a Questions, discussions and examples

<b>Eighth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	A study of vegetab belonging to Crusader fam including (Laha Kalim, Shalga Radish, Cauliflov and Rashad) in ter of the original habi nutritional importance, grow factors, flowers, yie pests and varieties.	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
<b>Ninth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of vegetab belonging to legume fam including (Pea Bean	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
<b>Tenth</b>	<b>2</b>	<b>Second month exam</b>			
<b>Eleven</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of vegetab belonging to legume fam including (Pea Bean	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
<b>Twelfth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Narcissism includes (onions, garlic, and leeks) and the production of onions and seeds	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
<b>Thirteen</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Narcissism includes (onions, garlic, and leeks) and the production of onions and seeds The vehicle inclu (lettuce and Almaza	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
<b>Fourteenth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Narcissism includes (onions, garlic, and leeks) and the production of onions and seeds The vehicle inclu (lettuce and Almaza	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
<b>Fifteen</b>	<b>2</b>	<b>Third month exam</b>			
<b>Course Evaluation</b>					

1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Produced by Dr. Abdul-Jabbar Jassem and Dr. Fadel Mosleh Al-Mohammadi. Crops Production, Vegetables + C2 Dr. Adnan Nasser Matlab and others 666 Advice in vegetable cultivation / methodological assistant Dr. Essam Al-Abadi 1989
Main references (sources)	<b>Anonymous.1977. growing your own vegetables U.S.D.A. information Bull</b>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

<b>Course Name:</b>	
Ornamental Plants1	
<b>Course Code:</b>	
AH1932	
<b>Semester / Year:</b>	
Semester	
<b>Description Preparation Date:</b>	
1 / 11/ 2023	
<b>Available Attendance Forms:</b>	
Theoretical material is given 100%. Practical material is given 100%	
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>	
30 hours / Units 3.0	
<b>Course administrator's name (mention all, if more than one name)</b>	
Name: Dr. Mahmood Shaker Ahmed Email: mahmood.ahmed@uoanbar.edu.iq	
<b>Course Objectives</b>	
Identifying different plant species, their requirements, flowering seasons, and methods of propagation and division	
<b>Teaching and Learning Strategies</b>	
<b>Strategy:</b>	
1- Follow the lecture method and use modern presentation methods.	
2- Conduct laboratory experiments.	
3- Direct dialogue with students by asking them questions.	

4- Homework assignments (writing scientific reports).  
5- Learning through applied laboratory work

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Definition of ornamental science	Lectures and field application	Questions, discussions and examples
Second	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of environmental factors	Lectures and field application	Questions, discussions and examples
Third	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of internal factors	Lectures and field application	Questions, discussions and examples
Fourth	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Rose Plant	Lectures and field application	Questions, discussions and examples
Fifth	3				
Sixth	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Chrysanthemum Plant	Lectures and field application	Questions, discussions and examples
Seventh	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Carnation Plant	Lectures and field application	Questions, discussions and examples
Eighth	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Bulbs Flowering	Lectures and field application	Questions, discussions and examples
Ninth	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Annuals Plants	Lectures and field application	Questions, discussions and examples
Tenth	3				

<b>Eleven</b>	<b>3</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Herbesus plant	Lectures and field application	Questions, discussions and examples
<b>Twelve</b>	<b>3</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Midicin Plants	Lectures and field application	Questions, discussions and examples
<b>Thirteen</b>	<b>3</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Propacation Plants	Lectures and field application	Questions, discussions and examples
<b>Fourth</b>	<b>3</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Indor plants	Lectures and field application	Questions, discussions and examples
<b>Fifteen</b>	<b>3</b>	<b>Third month exam</b>			
<b>Course Evaluation</b>					
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.					
<b>Learning and Teaching Resources</b>					
Ornamental Plant in iraq			Simi Karim M. Amin		
Main references (sources)			. Bhattacharjee, Supriya Kumar. 2006. Advances in Ornamental Horticulture. Vol. 3. Bulbous Ornamentals and Aquatic Plants. Pointer Publishers, India		
Recommended books and references (scientific journals, reports...)			Bhattacharjee, Supriya Kumar. 2006. Advances in Ornamental Horticulture. Vol. 4. Ornamental Crop Production Technology. Pointer Publishers, India		
Electronic References, Websites			<a href="http://en.Wikipedia.org/wiki/Rose_oil">http://en.Wikipedia.org/wiki/Rose oil</a> <a href="http://mousou3a.educdZ.com">http://mousou3a.educdZ.com</a>		

<b>Course Name:</b>					
Design and analysis of experiments					
<b>Course Code:</b>					
AH1933					
<b>Semester / Year:</b>					
3th / fall					
<b>Description Preparation Date:</b>					
8 / 1/ 2024					
<b>Available Attendance Forms:</b>					
attendance is according to the lecture schedule					
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>					
70 hours / Units 3.5					
<b>Course administrator's name (mention all, if more than one name)</b>					
Name: prof.Dr. Saad A. Mahmood Email: <a href="mailto:saad.abd@uoanbar.edu.iq">saad.abd@uoanbar.edu.iq</a>					
<b>Course Objectives</b>					
<b>1- The ability to understand the basics of design and analysis of experiments</b>		.....			
<b>2- Increasing the skills of primary school student in using statistical designs in analyzing agricultural experiment data</b>		.....			
<b>3- Students' ability to use these skills in agricultural experiments</b>		.....			
<b>Teaching and Learning Strategies</b>					
<b>1- Follow the lecture method and use modern presentation methods.</b>					
<b>2- Direct dialogue with students by asking them questions</b>					
<b>3- Homework assignments (solving exercises and examples)</b>					
<b>4- Learning through applied designs.</b>					
<b>Course Structure</b>					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>



<b>First</b>	<b>5</b>	Understand and comprehend the concepts of designing and analyzing experiments	Introduction to some concepts of experimental design and analysis	White board	<b>Questions, discussions and examples</b>
<b>Second</b>	<b>5</b>	The ability to understand the steps of conducting an experiment	Steps to conduct the experiment	White board	<b>Questions, discussions and examples</b>
<b>Third</b>	<b>5</b>	Understand the data analysis steps to design a CRD	Completely randomized design	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Fourth</b>	<b>5</b>	Learn how to use LSD test tables	LSD test	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Fifth</b>	<b>5</b>	Learn how to use Duncan test tables	Duncan's multinomial test	Whiteboard with personal computers	
<b>Sixth</b>	<b>5</b>	Understand and comprehend the steps of analyzing RCBD design data	Randomized complete block design (RCBD).	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Seventh</b>	<b>2</b>		First month exam		<b>Questions, discussions and examples</b>
<b>Eighth</b>	<b>5</b>	Understand the steps of data analysis with a Latin square design	Latin square	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Ninth</b>	<b>5</b>	Understand the steps of analysis using factorial experiments	Global experiments	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Tenth</b>	<b>5</b>	Ability to handle data in factorial experiments with two factors Factorial experiments with two factors	Factorial experiments with two factors	Factorial experiments with two whiteboard workers and personal computers	
<b>Eleven</b>	<b>5</b>	Ability to handle data in factorial experiments with three factors	Factorial experiments with three factors	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Twelfth</b>	<b>2</b>		Second month exam		<b>Questions, discussions and examples</b>

<b>Thirteen</b>	<b>5</b>	Understand the steps of data analysis by designing split plots	Splinter design	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Fourteenth</b>	<b>5</b>	Understand the steps of data analysis by designing split plots	Design of split pieces by three factors	Whiteboard with personal computers	<b>Questions, discussions and examples</b>
<b>Fifteen</b>	<b>2</b>		Third month exam		
<b>Course Evaluation</b>					
1- Monthly exams. 2- Rapid exams (Quazat). 3- Evaluation through classroom activity 4- By solving exercises and examples of agricultural experimental designs 5- Final exams.					
<b>Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)			1-Statistics and experimental design Professor Dr. Shaker Musleh Al-Mohammadi Professor Dr. Fadel Musleh Al-Mohammadi 2- Design and analysis of agricultural traders Dr. Khasha Mahmoud Al-Rawi		
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

<b>Course Name:</b>	
Plant Growth Regulators	
Course Code:	
<b>AH1934</b>	
Semester / Year:	
Autumn / 2023	
Description Preparation Date:	
2023/9/15	
Available Attendance Forms:	
It is given in the presence of the students	
Number of Credit Hours (Total) / Number of Units (Total)	
75 hours / 3.5 units	
Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Dr. Atheer Mohammed Ismail Email: <a href="mailto:ag.atheer.mohammed@uoanabr.edu.iq">ag.atheer.mohammed@uoanabr.edu.iq</a>	
Course Objectives	
<b>Course Objectives</b>	1- Introduce students to hormones and plant growth regulators, their types, and the common relationship between them

	<p>in their synergistic or antagonistic effects, as well as their physiological effects that contribute to a large extent to plant growth and development</p> <p><b>2</b> - Enable students to know the terms related to plant growth regulators and their horticultural and field applications.</p> <p><b>3</b> - Recognize the relationship of growth regulators with the environmental factors surrounding the plant and their interaction with the growth stage and anatomical structure.</p> <p><b>4</b> - Recognize the biosynthetic pathways of plant hormones and the physiological effects on plant growth and development.</p> <p><b>5</b> - Field applications of plant growth regulators and their uses in the field of plant tissue culture technology.</p>
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#### Teaching and Learning Strategies

<b>Strategy</b>	<ol style="list-style-type: none"> <li>1- Follow the lecture style with the use of modern means of presentation.</li> <li>2- Conducting laboratory experiments.</li> <li>3- Direct dialogue with students by asking them questions.</li> <li>4- Homework (writing scientific reports).</li> <li>5- Learning through applied field practices.</li> </ol>
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#### Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
<b>The first</b>	5 hr.	<ol style="list-style-type: none"> <li>1- Lectures</li> <li>2- the computer</li> <li>3- A modern mobile device</li> <li>4- Observations and field application</li> </ol>	<p><b>Theoretical:</b> Plant Hormones (Preface and Terminology)</p> <p><b>Practical:</b> Preparation and use of the different concentrations of plant growth regulators</p>	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Second</b>	5 hr.	<ol style="list-style-type: none"> <li>1- Lectures</li> <li>2- the computer</li> <li>3- A modern mobile device</li> <li>4- Observations and field application</li> </ol>	<p><b>Theoretical:</b> Auxins, Nature of auxins, Biosynthesis of auxin (IAA), Auxin transport (IAA), Auxins inhibitors, Auxins mechanism of action, Physiological effects of auxins</p> <p><b>Practical:</b> Practical examples of the use of plant growth regulators (Auxins)</p>	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Third</b>	5 hr.	<ol style="list-style-type: none"> <li>1- Lectures</li> <li>2- the computer</li> </ol>	<p><b>Theoretical:</b> Gibberellins (GA<sub>5</sub>),</p>	Theoretical lectures	Questions, discussions

		<p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p>Reasons for the variations in the structural formulas of gibberellins, Sites of gibberellins biosynthesis, Biosynthesis of gibberellins, Inhibitors of gibberellins biosynthesis, Gibberellins transport, GA<sub>5</sub> mechanism of action, Physiological effects of gibberellins</p> <p><b>Practical:</b> Practical examples of the use of plant growth regulators (Gibberellins)</p>	<p>and practical application laboratories and fields.</p>	<p>and examples</p>
<b>Fourth</b>	5 hr.	<p><b>1-</b> Lectures</p> <p><b>2-</b> the computer</p> <p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p><b>Theoretical:</b> Cytokinins (CKs), Nature of cytokinins, Correlative growth phenomena, Biosynthesis of cytokinins, Cytokinins transport, Cytokinins mechanism of action, Physiological effects of cytokinins</p> <p><b>Practical:</b> Conversion systems and units of measurement</p>	<p>Theoretical lectures and practical application laboratories and fields.</p>	<p>Questions, discussions and examples</p>
<b>Fifth</b>	5 hr.	<p><b>1-</b> Lectures</p> <p><b>2-</b> the computer</p> <p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p><b>Exam</b></p>	<p>Theoretical lectures and practical application laboratories and fields.</p>	<p>Questions, discussions and examples</p>
<b>Sixth</b>	5 hr.	<p><b>1-</b> Lectures</p> <p><b>2-</b> the computer</p> <p><b>3-</b> A modern mobile device</p> <p><b>4-</b> Observations and field application</p>	<p><b>Theoretical:</b> Ethylene Ethylene nature, Ethylene biosynthesis Ethylene transport, Ethylene mode of action, Ethylene degradation, Ethylene biosynthesis and active inhibitors, Ethylene a</p>	<p>Theoretical lectures and practical application laboratories and fields.</p>	<p>Questions, discussions and examples</p>

			fruit ripening, Ethylene releasing compounds (ERC), Physiological effects of ethylene <b>Practical:</b> System of foliar application		
<b>Seventh</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> Absciscic acid (ABA), Nature of ABA, Absciscic acid biosynthesis, ABA transport, ABA mechanism of action, Physiological effects of absciscic acid <b>Practical:</b> Field applications of the foliar spray system	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Eighth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> Plant growth retardants, Physiological effects of plant growth retardants <b>Practical:</b> Bioassays of plant growth regulators	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Ninth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Theoretical:</b> Brassinosteroids (BRs), Chemical characteristics of BRs, Biosynthesis of BRs, Transport and metabolism of brassinosteroids, Physiological effects of BRs, Interaction of brassinosteroids with other hormones <b>Practical:</b> The pH of the solution and its interaction with plant growth regulators	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Tenth</b>	5 hr.	1- Lectures 2- the computer 3- A modern mobile device 4- Observations and field application	<b>Exam</b>	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples

<b>Eleventh</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> Salicylic acid (SA), Salicylic acid levels in plants, Biosynthesis pathway of SA production, Conjugation and partitioning of salicylic acid, Movement and transport of salicylic acid, Physiological effects of salicylic acid, Role of SA in thermogenesis, Role of SA in pathogen defense <b>Practical:</b> Application on the physiological effects of plant growth regulators (Cytokinins and Ethylene)	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Twelfth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> Jasmonic acid (JA), Jasmonic acid and plant responses, Jasmonic acid and plant resistance, Nature of methyl jasmonic acid (MeJA), Jasmonic acid as an endogenous growth regulator, Sites and biosynthesis of JA, Role and activity of JA, Physiological effects of jasmonic acid <b>Practical:</b> Application on the physiological effects of plant growth retardants	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Thirteenth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> Polyamines (PAs), Polyamines biosynthesis, Interaction between polyamines and	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples

			other plant hormones Physiological effects of polyamines <b>Practical:</b> Tissue culture, micro propagation and applications of Plant growth regulators		
<b>Fourteenth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Theoretical:</b> The interaction between plant growth regulators, plant growth stage, anatomical structure and environmental factors <b>Practical:</b> Preparation and use of the different concentrations of plant growth regulators	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples
<b>Fifteenth</b>	5 hr.	<b>1-</b> Lectures <b>2-</b> the computer <b>3-</b> A modern mobile device <b>4-</b> Observations and field application	<b>Exam</b>	Theoretical lectures and practical application laboratories and fields.	Questions, discussions and examples

#### 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.

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)	Al-Khafaji, M. A. 2014. Plant Growth Regulators, Applications and Horticultural Uses. Ministry of Higher Education and Scientific Research, University of Baghdad, College of Agriculture, Iraq.
Main references (sources)	Davies, P. J. 2010. The plant hormones: Their nature, occurrence and functions. In: Plant Hormones: Physiology, Biochemistry and Molecular Biology, 833. Dordrecht; Boston, MA: Kluwer Academic Publishers.
Recommended books and references (scientific journals, reports...)	Halmann, M. 1990. Synthetic plant growth regulators. Advances in Agronomy, 43: 47-105.
Electronic References, Websites	

1. Course Name:	
Plant Ecology	
2. Course Code:	
AH1936	
3. Semester / Year:	
Autumn2023-2024	
4. Description Preparation Date:	
2023/12/30	
5. Available Attendance Forms:	
My attendance is according to the lecture schedule	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hour	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mukhalad Hadi Ismali Email: <a href="mailto:mhalani@uoanbar.edu.iq">mhalani@uoanbar.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b> 1- Plant ecology studies environmental factors and their relationship with crops. 2- It includes knowledge of climatic factors, soil factors, and biological factors. 3- Knowing the appropriate environment for each agricultural crop. 4- Knowing the effects of temperature and light intensity on crops. 5- Study of environmental pollution. 6- Identify the water needs and factors that affect the water needs of the crop.	<ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>
9. Teaching and Learning Strategies	
<b>Strategy</b> 1- Follow the lecture method and use modern presentation methods 2- Conduct laboratory experiments 3- Direct dialogue with students by asking them questions 4- Homework (writing scientific reports)	
10. Course Structure	



Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
<b>1- Course Structure</b>					
Week	Hours	ILOs	Unit/Module orTopic Title	Teaching Method	Assessment Method
First	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Grapes and their economic importance and nutritional value	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Second	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Grape classification	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Preparing a nursery for the propagation of grapes in various ways	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Suitable environment for farming	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2-Modern mobile device 3- Observations and field applications	The phenotypic structure of the grape tree	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples

Seventh	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Annual cycle of grape vine growth	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples		
Eighth	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Grape propagation	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples		
Ninth	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Breeding and pruning grapes	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples		
Tenth	2	Second month exam					
Eleven	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Study of the small fruits (strawberry, raspberry, blackberry, blueberry, currant, cosberry, cranberry) in terms of their importance and the appropriate environment for them, their propagation, cultivation and service processes	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples		

Twelfth	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Methods of cultivation and production of strawberry, raspberry, blackberry, currant, blueberry, cranberry and service and harvest operations	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Thirteen	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Growing grapes on the slopes in northern Iraq	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Fourteenth	2	1- Computer 2-Modern mobile device 3- Observations and field applications	Some agricultural service operations for grapes	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Fifteen	2	Third month exam			

#### 11. Course Evaluation

- 1- Monthly tests
- 2- Rapid tests (COUZ)
- 3- Evaluation of classroom activity
- 4- Preparing scientific reports
- 5- Final exams

#### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Plant Ecology 2015. Dr. Iyad Hussein Al-Muaini. 2- Plant Ecology 2019. Dr. Abdul Rahim Sul Muhammad. Issam Abdullah Bashir and Dr. Kar Benjamin Esho.
Main references (sources)	Plant Ecology 2002. Kamal Hussein Shaltout. - Recent articles from the Internet and from special scientific journals.
Recommended books and references (scientific journals, reports...)	Taiz , L. and Zeiger,E.2006. Plant physiology,4 <sup>th</sup> ,Sunderland MA,U.S.A.
Electronic References, Websites	

<b>Course Name:</b>	
summer vegetable production	
<b>Course Code:</b>	
AH19310	
<b>Semester / Year:</b>	
Semester	
<b>Description Preparation Date:</b>	
1 / 2/ 2024	
<b>Available Attendance Forms:</b>	
Theoretical material is given 100%. Practical material is given 100%	
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>	
30 hours / Units 3.5	
<b>Course administrator's name (mention all, if more than one name)</b>	
Name: Dr. omar hashim muslah Email: ohmosleh@uoanbar.edu.iq	
<b>Course Objectives</b>	
<b>Course Objectives:</b>	.....
1 Studying the various environmental factors affecting growth and yield formation	.....
2- Learn about the methods of classifying vegetable crops.	.....
3- Knowing the appropriate soil for each of agricultural crops To identify the methods of cultivation and production of vegetable crops belonging to the various summer families	
4- - Knowing the damages of temperature and intensity of lighting to crops	
<b>Teaching and Learning Strategies</b>	

**Strategy:**

- 1- Follow the lecture method and use modern presentation methods.
- 2- Conduct laboratory experiments.
- 3- Direct dialogue with students by asking them questions.
- 4- Homework assignments (writing scientific reports).
- 5- Learning through applied laboratory work

**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
<b>First</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	A study of the crops the nightshade fam including potatoes	Electronic lectu and application laboratories fields	Questions, discussions and examples
<b>Second</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Taught in terms of ori and environmer needs	Electronic lectu and application laboratories fields	Questions, discussions and examples
<b>Third</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	According to the sta of growth, fertilizati harvesting and variet	Electronic lectu and application laboratories fields	Questions, discussions and examples
<b>Fourth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Eggplant includes a study of the importance of the crop and factors The environment, growth, flowering, knotting, fruit ripening, and most importantly pests	Electronic lectu and application laboratories fields	Questions, discussions and examples
<b>Fifth</b>	<b>2</b>	First month exam			
<b>Sixth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	Pepper including the study of the importance of the crop and factors	Electronic lectu and application laboratories fields	Questions, discussions and examples
<b>Seventh</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	A study of vegetables belonging to the Crusader family, including (Lahana, Kalim, Shalgam, Radish, Cauliflower	Electronic lectu and application laboratories fields	Questions, discussions and examples

			and Rashad) in terms of the original habitat, nutritional importance, growth factors, flowers, yield, pests and varieties.		
<b>Eighth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	<b>Cucumber includes studying the importance of the crop and the factors</b>	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
<b>Ninth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	<b>Watermelon, including the study of flowers and fruit set Changes that occur at maturity and cultivation methods the crop</b>	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
<b>Tenth</b>	<b>2</b>	<b>Second month exam</b>			
<b>Eleven</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	<b>Musk melon , including the study of flowers and fruit set Changes that occur at maturity and cultivation methods the crop</b>	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
<b>Twelfth</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	<b>Squash, zucchini, arac, asala, and cucumber, and includes Study of environmental factors, flowering, knots, and most importantly Varieties and pests</b>	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples
<b>Thirteen</b>	<b>2</b>	1- Computer 2-Modern mobile device 3-Observations and field applications	<b>Narcissism includes (onions, garlic, and leeks) and the production of onions and seeds</b>	Electronic lectu and pract application laboratories a fields	Questions, discussions and examples

			The vehicle inclu (lettuce and Almazah		
Fourteenth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of environmer factors as well as sw corn	Electronic lectu and pract application laboratories fields	Questions, discussions and examples
Fifteen	2	Third month exam			

#### Course Evaluation

- 1- Monthly exams.
- 2- Rapid exams .
- 3- Evaluation through classroom activity.
- 4- By preparing scientific reports and taking advantage of information networks.
- 5- Final exams.

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)	Produced by Dr. Abdul-Jabbar Jassem and Dr. Fadel Mosleh Al-Mohammadi. Crops Production, Vegetables + C2 Dr. Adnan Nasser Matlab and others 666 Advice in vegetable cultivation / methodological assistant Dr. Essam Al-Abadi 1989
Main references (sources)	<b>Anonymous.1977. growing your own vegetables U.S.D.A. information Bull</b>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

<b>Course Name:</b>	Ornamental Plants2
Course Code:	<b>AH19311</b>
Semester / Year:	<b>Spring /2024</b>
Description Preparation Date:	<b>1 / 11/ 2023</b>
Available Attendance Forms:	Theoretical material is given 100%. Practical material is given 100%
Number of Credit Hours (Total) / Number of Units (Total)	30 hours / Units 3.0
Course administrator's name (mention all, if more than one name)	Name: Dr. Mahmood Shaker Ahmed Email: mahmood.ahmed@uoanbar.edu.iq
Course Objectives	

Identifying different plant species, their requirements, flowering seasons, and methods of propagation and division

Teaching and Learning Strategies

**Strategy:**

- 1- Follow the lecture method and use modern presentation methods.
- 2- Conduct laboratory experiments.
- 3- Direct dialogue with students by asking them questions.
- 4- Homework assignments (writing scientific reports).
- 5- Learning through applied laboratory work

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of ornamental trees	Lectures and field application	Questions, discussions and examples
Second	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Study of ornamental Shrubs	Lectures and field application	Questions, discussions and examples
Third	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Climbers Plants	Lectures and field application	Questions, discussions and examples
Fourth	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Hydrophytes Plants	Lectures and field application	Questions, discussions and examples
Fifth	3				
Sixth	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Cacti Plants	Lectures and field application	Questions, discussions and examples
Seventh	3	1- Computer 2-Modern mobile device 3-Observations and field applications	Hydrophytes Plants	Lectures and field application	Questions, discussions and examples
Eighth	3	1- Computer 2-Modern mobile device	Cut Flowers	Lectures and field application	Questions, discussions and examples



		<b>3-Observations and field applications</b>			
<b>Ninth</b>	<b>3</b>	<b>1- Computer 2-Modern mobile device 3-Observations and field applications</b>	Propagation plants	<b>Lectures and field application</b>	<b>Questions, discussions and examples</b>
<b>Tenth</b>	<b>3</b>				
<b>Eleven</b>	<b>3</b>	<b>1- Computer 2-Modern mobile device 3-Observations and field applications</b>	Lawns	<b>Lectures and field application</b>	<b>Questions, discussions and examples</b>
<b>Twelfth</b>	<b>3</b>	<b>1- Computer 2-Modern mobile device 3-Observations and field applications</b>	Arrangement Flowers	<b>Lectures and field application</b>	<b>Questions, discussions and examples</b>
<b>Thirteenth</b>	<b>3</b>	<b>1- Computer 2-Modern mobile device 3-Observations and field applications</b>	Ornamental herbs	<b>Lectures and field application</b>	<b>Questions, discussions and examples</b>
<b>Fourteenth</b>	<b>3</b>	<b>1- Computer 2-Modern mobile device 3-Observations and field applications</b>	Miniature gardens	<b>Lectures and field application</b>	<b>Questions, discussions and examples</b>
<b>Fifteenth</b>	<b>3</b>	<b>Third month exam</b>			
<b>Course Evaluation</b>					
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.					
<b>Learning and Teaching Resources</b>					
Ornamental Plant in Iraq			Simi Karim M. Amin		
Main references (sources)			. Bhattacharjee, Supriya Kumar. 2006. Advances in Ornamental Horticulture. Vol. 3. Bulbous Ornamentals and Aquatic Plants. Pointer Publishers, India		
Recommended books and references (scientific journals, reports...)			Bhattacharjee, Supriya Kumar. 2006. Advances in Ornamental Horticulture.		

	Vol. 4. Ornamental Crop Production Technology. Pointer Publishers, India
Electronic References, Websites	<a href="http://en.Wikipedia.org/wiki/Rose_oil">http://en.Wikipedia.org/wiki/Rose oil</a> <a href="http://mousou3a.educdZ.com">http://mousou3a.educdZ.com</a>

<b>Course Name: Horticulture and vegetable diseases</b>	
Course Code: <b>AH19313</b>	
Semester / Year: SPRING 2023-2024	
Description Preparation Date: 8/4/2024	
Available Attendance Forms: IN CLASS	
Number of Credit Hours (Total) / Number of Units (Total): 5HOURS/3.5 UNITS	
Course administrator's name (mention all, if more than one name) Name: Assist. Prof. Dr. Jasim Mahmood Abed ag.jasim.mahmoodl@uoanbar.edu.iq	
<b>Course Objectives</b>	
<b>Course Objectives</b>	<b>1- Knowledge and Understanding</b> <b>A1. Understand the concept of plant disease</b> <b>2. Distinguishing between communicable and non-communicable diseases</b> <b>3. Distinguishing between the types of pathogens: fungal, bacterial, alphaviral, nematode and others</b> <b>4. The most important losses caused by vegetable diseases in open and protected agriculture</b> <b>5. Knowing the most important diseases that affect vegetable crops in open and protected agriculture.</b>

	<b>6 . Identify the characteristics of protected agriculture in terms of productivity and the environments it requires.</b>
<b>Teaching and Learning Strategies</b>	
<b>Strategy</b>	Teaching theoretical parts in class by using data show and some new methods, Teaching the practical part through field visits/work in the department's laboratories
<b>Course Structure</b>	

<b>Course Name:</b>	
Breeding horticultural plants	
<b>Course Code:</b>	
AH19314	
<b>Semester / Year:</b>	
The second spring semester	
<b>Description Preparation Date:</b>	
8/4/2024	
<b>Available Attendance Forms:</b>	
1- Theoretical subject: given in class 2- Practical subject: given in greenhouses	
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>	
5 hours / number of units 3	
<b>Course administrator's name (mention all, if more than one name)</b>	
Name: Email:	
<b>Course Objectives</b>	
<b>Course Objectives</b>	<b>Introduction to plant petrification and a historical overview of the subject.</b> <b>Learn about plant breeding methods and their type</b> <b>How to perform the hybridization process, types of flowers, bagging methods, and pollination.</b> <b>Training on tools, how to select and choose the desired genetic traits</b> <b>Identifying male infertility, its causes, incompatibility and its causes</b>

**Self-breeding and cross-pollination methods**

**Teaching and Learning Strategies**

<b>Strategy</b>	<p>1- Follow the lecture method and use modern presentation methods.</p> <p>2- Conducting field experiments for various crops.</p> <p>3- Direct dialogue with students by asking them questions.</p> <p>4- Homework assignments (writing scientific reports).</p> <p>5- Learning through practical hybridization and cultivation genetic compositions.</p>
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**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
first	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Introduction and historical overview of plant breeding. Goals Types of Plant breeding	Electronic lectures and practical application in Laboratories say	Questions, discussions and examples
second	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Hybridization types of hybrid	Electronic lectures and practical application in Laboratories say	Questions, discussions and examples
third	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Selection and methods Election	Electronic lectures and practical application in Laboratories say	Questions, discussions and examples
fourth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Types of Selection	Electronic lectures and practical application in	Questions, discussions and examples

				Laboratories say	
Fifth	five hou		First month exam		
sixth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Male sterility Practical cultivatio Breeds For cross breeding training	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
seventh	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Selection and its types	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
eighth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Election methods	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
Ninth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Breeding to resist Diseases	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
tenth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Plant breeding Self-pollinating	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
eleventh	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Breeding cross-pollinated plants	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples

twelveth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Plant breeding Vegetative reproduction	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
Thirteenth	five hou	1- Computer 2- A modern mod device 3-Field observati and applications	Breeding using Genetic Engineeri And modern technologies	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
fourteenth	five hou		First month exam		

#### 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

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

#### Course Name:

Medicinal and aromatic plants

#### Course Code:

**AH19315**

#### Semester / Year:

The second Semester

#### Description Preparation Date:

1-2-2024

#### Available Attendance Forms:

weekly

#### Number of Credit Hours (Total) / Number of Units (Total)

Five hours a week

3.5 units

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

Name: Assist. Prof. Dr. Osama Hussein Mahidi

Email: [ag.osama.hussein@uoanbar.edu.iq](mailto:ag.osama.hussein@uoanbar.edu.iq)

<b>Course Objectives</b>	
Identifying medicinal plants, their divisions, sources, the nature of their active compounds and methods of extracting them	
<b>Teaching and Learning Strategies</b>	
<b>Strategy</b>	<ul style="list-style-type: none"> <li>1- Lecture and presentation</li> <li>2- Discussion</li> <li>3- Presentation of academic problems</li> <li>4- Finding appropriate solutions</li> <li>5- Brainstorming</li> <li>6- Collaborative style</li> <li>7- Study previous lectures</li> </ul>

## Course Description Form(The Fourth Stage)

13. Course Name:					
Tissue Culture					
14. Course Code:					
AH1940					
15. Semester / Year:					
Semester					
16. Description Preparation Date:					
1 / 11/ 2023					
17. Available Attendance Forms:					
Theoretical material is given 100%. Practical material is given 100%					
18. Number of Credit Hours (Total) / Number of Units (Total)					
30 hours / Units 3.5					
19. Course administrator's name (mention all, if more than one name)					
Name: Dr. Yasir Sayel Sekhi Email: yassirsayel@uoanbar.edu.iq					
20. Course Objectives					
<b>Course Objectives:</b>			<ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>		
<b>1- Its use in the field of plant breeding, improvement and conservation</b>					
<b>Genetic sources</b>					
<b>2- Rapid multiplication of plants.</b>					
<b>3- Production of secondary compounds and medical drugs.</b>					
<b>4- Producing virus-free plants</b>					
21. Teaching and Learning Strategies					
<b>Strategy:</b>					
1- Follow the lecture method and use modern presentation methods.					
2- Conduct laboratory experiments.					
3- Direct dialogue with students by asking them questions.					
4- Homework assignments (writing scientific reports).					
5- Learning through applied laboratory work					
22. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Introduction and history of plant tissue culture	Electronic and application laboratories and field	lectures and practical Questions, discussions and examples



Second	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Physiological factors affect growth and morphogenesis	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Using tissue cult for plant propagation techniques	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Applications for plant cell and tissue culture in the field of plant breeding and improvement to produce healthy plants from infections with specific pathogens.	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Fifth	2	First month exam				
Sixth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Secondary Metabolites Production	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Seventh	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Callus cultures	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Eighth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Plant tissue cult application	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Ninth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Isolation Culture Protoplast	Electronic and application laboratories and fie	lectu pract	Questions, discussions and examples
Tenth	2	Second month exam				
Eleven	2	1- Computer 2-Modern mobile device	Embryo Culture Embryogenesis	Electronic and	lectu pract	Questions, discussions and examples

		3-Observations and field applications		application laboratories and fie	
Twelfth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Somatic Embryogenesis	Electronic and application laboratories and fie lectu pract	Questions, discussions and examples
Thirteen	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Anther and pol culture	Electronic and application laboratories and fie lectu pract	Questions, discussions and examples
Fourteenth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Synthetic Technology	Electronic and application laboratories and fie lectu pract	Questions, discussions and examples
Fifteen	2	Third month exam			

#### 23. Course Evaluation

- 1- Monthly exams.
- 2- Rapid exams .
- 3- Evaluation through classroom activity.
- 4- By preparing scientific reports and taking advantage of information networks.
- 5- Final exams.

#### 24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Muhammad Abbas Salman / Basics of plant cell and tissue culture / University of Baghdad
Main references (sources)	George, E. F., Hall, M. A., & De Klerk, G. J. (2008). <i>Pl propagation by tissue culture 3rd Edition. Netherland, The Back Ground Springer.</i>
Recommended books and references (scientific journals, reports...)	Plant Cell, Tissue and Organ Culture (PCTOC) <a href="https://link.springer.com/journal/11240">https://link.springer.com/journal/11240</a>
Electronic References, Websites	

<b>Course Name:</b>	
<b>Evergreen Fruits</b>	
<b>Course Code:</b>	
<b>AH1941</b>	
<b>Semester / Year:</b>	
<b>Fourth stage / Autumn Semester /2024</b>	
<b>Description Preparation Date:</b>	
<b>15/2/2024</b>	
<b>Available Attendance Forms:</b>	
<b>Theoretical and practical lectures according to the weekly schedule Field application for the practical aspect Field visits</b>	
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>	
<b>30 hours /3.5 unit</b>	
<b>Course administrator's name (mention all, if more than one name)</b>	
<b>Name: Prof.Dr.Thamer Hameed Reja Email: <a href="mailto:ag.thamer.hameed@uoanbar.edu.iq">ag.thamer.hameed@uoanbar.edu.iq</a></b>	
<b>Course Objectives</b>	
<p><b>Course Objectives</b></p> <p>A- Introducing the importance of sustainable fruit types, methods of propagating and caring for them, and the possibility of expanding their cultivation.</p> <p>B- Paying attention to the productivity and development of evergreen fruit cultivation.</p> <p>C- Knowing the climatic environment for each type of fruit and ways to adapt to the climate in Iraq.</p> <p>D- Paying attention to how to establish evergreen orchards and the dimensions of cultivation for each type, while identifying the water and fertilizer needs of each type of evergreen fruit.</p>	
<b>Teaching and Learning Strategies</b>	
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. Preparing presentations that explain the basic concepts in the field of horticulture and providing detailed lectures on various topics. Use pictures and illustrations to better illustrate ideas and concepts.</li> <li>2. Organize interactive sessions and workshops that allow participants to actively participate in the learning process. Practical models of growing and establishing sustainable orchards are presented, and participants are encouraged to participate and actually apply.</li> <li>3. Organize field trips to government orchards, nurseries and local farms. Explain how to care and maintain it.</li> <li>4. Using multimedia, mobile applications, and educational programs to provide information and interact with students</li> </ol>

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First week	5	Identify the climatic zones and climatic needs of different fruits	importance of evergreen fruit trees, and identify the climatic division of fruit trees	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
Second week	5	Identify the citrus genus and the divisions of each genus according to the species it contains.	Possibility of identifying the phenotypic characteristics of different citrus species	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
Third week	5	The ability to identify the phenotypic characteristics of different citrus species and hybrids resulting from crossbreeding between different species	Identify the citrus genera and the divisions of each genus according to the species they contain, in addition to the hybrids resulting from crossbreeding between these species and genera.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
Fourth week	5	The ability to distinguish different varieties, of course, by their vegetative system	Botanical description, nutritional value, climatic conditions, plant divisions, and internal and external factors affecting the	Theoretical lectures and field and laboratory applications	Questions, discussions and examples

			growth of citrus trees.		
<b>Fifth week</b>	5	Identify the climatic factors such as high and low temperatures, the negative damages resulting from them, and ways to protect them	Climatic factors affecting citrus trees, methods of protection from temperature damage, and methods of propagation.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Sixth week</b>	5	Diagnosing citrus rootstocks suitable for grafting	Citrus origins, crop service operations, pests and diseases that affect citrus trees.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Seventh week</b>	5	Identifying the areas of olive propagation, the environment suitable for the propagation of olive trees, and the biology of flowers and fruits.	Olives, the original habitat, spread, the appropriate environment for the spread of olive trees, and the biology of flowers and fruits.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Eighth week</b>	5	Identify the types of soil suitable for olive cultivation and the propagation methods used	Specifications of the soil in which olive trees are grown and the propagation methods used.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Ninth week</b>	5	Diagnosing the most important problems due to the lack of spread of olive cultivation in Iraq	Obstacles to olive tree cultivation, crop service, pollination, and knotting operations.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Tenth week</b>	5	Getting to know the original place of banana cultivation and the most	Bananas, original habitat, types, suitable environment for	Theoretical lectures and field and	Questions, discussions and examples

		important service operations	agriculture, agricultural operations in banana fields	laboratory applications	
<b>Eleventh week</b>	5	The possibility of identifying the pineapple fruit, its place of spread, and the conditions affecting it	Pineapple, original habitat, suitable environment, climatic conditions, pollination and contraction, and methods of reproduction	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Twelveth week</b>	5	Diagnosing and knowing the original habitat of the mango, contract conditions, pollination, and contract problems	Mango, original habitat, botanical description, environmental conditions, flowering, knotting, pollination and knotting problems.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Thirteenth week</b>	5	Diagnosing and knowing the original habitat of the mango, contract conditions, pollination, and contract problems	Mango, original habitat, botanical description, environmental conditions, flowering, knotting, pollination and knotting problems	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Fourteenth week</b>	5	Identifying the Sidr fruit and the conditions affecting its growth	Sidr, original habitat, botanical description, and methods of propagation.	Theoretical lectures and field and laboratory applications	Questions, discussions and examples
<b>Fifteenth week</b>	5	An exam, and a visit to one of the evergreen fruit orchards and	An exam, and a visit to one of the evergreen fruit orchards and	Theoretical lectures and field and laboratory	Questions, discussions and examples

	propagation nurseries.	propagation nurseries	applications	
<b>Course Evaluation</b>				
1- Monthly written exams. 2- Direct oral exams and field work in the college's fields. 3- Through classroom activities and tests.				
<b>Learning and Teaching Resources</b>				
Required textbooks (curricular books, if any)		1- Evergreen fruit. 1990. Dr. Makki Alwan and Alaa Abdel Razzaq. 2- Production of evergreen fruits. 1991. Dr. Daoud Abdullah Daoud and Jawad Dhanoun Agha.		
Main references (sources)				
Recommended books and references (scientific journals, reports...)		1- Modern scientific research. 2- Recent articles from the Internet and from specialized scientific journals.		
Electronic References, Websites				

<b>Course Name:</b>	
<b>Seed production</b>	
Course Code:	
AH1942	
Semester / Year:	
Semester	
Description Preparation Date:	
1 / 11/ 2023	
Available Attendance Forms:	
Theoretical material is given 65%. Practical material is given 35%	
Number of Credit Hours (Total) / Number of Units (Total)	
30 hours / Units 3.5	
Course administrator's name (mention all, if more than one name)	
Name: Dr. Hmood gharbi khaleefa Email: <a href="mailto:ag.hammood.gharbi@uoanbar.edu.iq">ag.hammood.gharbi@uoanbar.edu.iq</a>	
<b>Course Objectives</b>	
<b>Course Objectives:</b> - Study of vegetable crops, their spread, areas of cultivation, and factors affecting seed production -Study the methods used in extracting seeds from soft dry fruits	..... ..... .....

- Study the environmental conditions suitable for growing each crop and the factors affecting seed production  
 -Know the economic importance of seed production  
 -Methods used in storing and marketing important seeds in the world

Teaching and Learning Strategies

**Strategy:**

- 1- Follow the lecture method and use modern presentation methods.
- 2- Conduct laboratory experiments.
- 3- Direct dialogue with students by asking them questions.
- 4- Homework assignments (writing scientific reports).
- 5- Learning through applied laboratory work

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	Seed science and the importance of seeds	Seed production/technology	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Second	2	The importance of seed production	Seeds	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Third	2	Methods of reproduction of flowering plants	Seed production/technology	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Fourth	2	How reproductive parts are formed in flowers	Seed production/technology	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples
Fifth	2	First month exam			



Sixth	2	Types of pollination and fertilization	Seed production/technology	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Seventh	2	Seed formation in flowering plants	Seeds	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Eighth	2	Chemical components of seeds/seed grading	Seed production/technology	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Ninth	2	The importance of seeds/seed industry and its production centers	Seed production/technology	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Tenth	2	<b>Second month exam</b>			
Eleven	2	Production of improved seeds/breeder seeds/basics/improved/certified seeds	Seed production/technology	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Twelfth	2	Seed quality	Seed production/technology	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Thirteen	2	Seed harvesting and extraction methods	Seed production/technology	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples

<b>Fourteen</b>	<b>2</b>	Examination of seeds/purity/vitality/mo ure	Seed production/technology	Electronic lectures & practical application laboratori and fields	<b>Questio ns, discussi ons and exampl es</b>
<b>Fifteen</b>	<b>2</b>	<b>Third month exam</b>			
<b>Course Evaluation</b>					
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.					
<b>Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)		1- Testing, defining and protecting new vegetable crop varieties 2008 2- Recent articles from the Internet and from specialized scientific journals and journals 3- Plant breeding and improvement 2020 Fouad Razzaq Al-Burki, Al-Muthanna University			
Main references (sources)		Principles of field crop production Seed production			
Recommended books and references (scientific journals, reports...)		Dr. Mohamed T Zalama, Seed Tech. R. Depart.,Field Crops R. Instit. ARC., dr.mtz.1979@gmail.com.			
Electronic References, Websites					

<b>Course Name:</b>
<b>Cultivation under protected environment</b>
Course Code:
AH1943
Semester / Year:
First fall semester
Description Preparation Date:
8/4/2024
Available Attendance Forms:
1- Theoretical subject: given in class 2- Practical subject: given in greenhouses
Number of Credit Hours (Total) / Number of Units (Total)
5 hours / number of units 3

Course administrator's name (mention all, if more than one name)					
Name:					
Email:					
Course Objectives					
Course Objectives		<p><b>Introducing protected facilities and their types.</b>  <b>Identify the reasons for using protected systems.</b>  <b>Plants that should be grown in protected environments.</b>  <b>Plant diseases that we face in the protected environment</b></p>			
Teaching and Learning Strategies					
Strategy		<p>1- Follow the lecture method and use modern presentation methods.  2- Conducting field experiments for various crops.  3- Direct dialogue with students by asking them questions.  4- Homework assignments (writing scientific reports).  5- Learning through practical hybridization and cultivation genetic compositions.</p>			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	five hours	1- Computer 2- A modern mobile device 3-Field observation and applications	Introduction and historical overview of The Development of agriculture Protected.	Electronic lectures and practical application in Laboratories say	Questions, discussions and examples
second	five hours	1- Computer 2- A modern mobile device 3-Field observation and applications	Factors affecting Creating greenhouses And choose the location the appropriate	Electronic lectures and practical application in Laboratories say	Questions, discussions and examples
third	five hours	1- Computer 2- A modern mobile device	The stages followed in	Electronic	Questions, discussions and examples

		3-Field observati and applications	Creating greenhouses	lectures and practical application in Laboratories say	
fourth	five hou	1- Computer 2- A modern mo device 3-Field observati and applications	Practical applications Scientific knowlec in building management Protected.	Electronic lectures and practical application in Laboratories say	Questions, discussions and examples
Fifth	five hou		First month exam		
sixth	five hou	1- Computer 2- A modern mo device 3-Field observati and applications	Farming methods Distances preparation	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
seventh	five hou	1- Computer 2- A modern mo device 3-Field observati and applications	Methods prevention And the fight	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
eighth	five hou	1- Computer 2- A modern mo device 3-Field observati and applications	Cooling systems And heating	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
Ninth	five hou	1- Computer 2- A modern mo device 3-Field observati and applications	Breeding to resist Diseases	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
tenth	five hou		First month exam		

eleventh	five hou	1- Computer 2- A modern mob device 3-Field observati and applications	Tomato productio In aprotected environment	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
twelveth	five hou	1- Computer 2- A modern mob device 3-Field observati and applications	Cucumber production greenhouses	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
Thirteenth	five hou	1- Computer 2- A modern mob device 3-Field observati and applications	Agricultural media And preparation methods	Electronic lectures and practical application in Laboratories and say	Questions, discussions and examples
fourteenth	five hou		Protected hydroponics syste		

#### 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

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

<b>Course Name:</b>	Engineering of Gardens
<b>Course Code:</b>	AH1944
<b>Semester / Year:</b>	Autumn(First) / 2023-2024
<b>Description Preparation Date:</b>	08-04-2024
<b>Available Attendance Forms:</b>	Theoretical subject: It is given through the lecture program

Practical subject: practical application Field visits Summer Training
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>
30 hours / Theoretical 45 hours / practical Total 75 hours
<b>Course administrator's name (mention all, if more than one name)</b>
Assent. Prof. Dr. Zeyad Mohammed Abdulrazzaq <a href="mailto:zeyadmohammed@uoanbar.eud.iq">zeyadmohammed@uoanbar.eud.iq</a>
<b>Course Objectives</b>
<p>Knowledge of garden design concepts, its elements, and the principles and rules followed in the design</p> <p>Levels and systems of design according to international and local planning standards.</p> <p>Factors affecting design and the stages followed in garden design and the importance of each stage in detail.</p> <p>Landscaping systems and their types from private gardens to parks outside cities and green belts.</p> <p>Knowledge of international, Arab and local garden design standards</p> <p>Knowledge of the design programs used in developing design proposals and training on one of these programs</p>
<b>Teaching and Learning Strategies</b>
<p>Brainstorming</p> <p>Thinking strategy according to the student's ability</p> <p>Critical Thinking is a term that symbolizes the highest level of thinking that aims to pose an issue and then analyze it logically to reach the required solution.</p> <p>Strategies of presentation, coordination, training, discussion, talking, listening, writing, reading, reading, thinking and reflecting</p> <p>Cognitive strategies, which are concerned with analyzing the topics to be studied, including naming, explaining, detailing, and organizing.</p> <p>Metacognitive strategies, which are concerned with managing the learning process, such as selective attention to a specific topic or part of it, monitoring understanding, controlling comprehension, and conducting self-evaluation of what has been learned.</p> <p>Social or affective strategies that are concerned with students' interaction with the teacher on the one hand and students' interaction with each other on the other hand, such as discussion and dialog with oneself.</p> <p>These strategies can be achieved through:</p> <p style="padding-left: 40px;">Adopting the method of giving theoretical lectures using various modern means of explanation, through which the design systems used in the past and present are recognized in terms of the pros and cons of each design and how to overcome the negatives.</p> <p style="padding-left: 40px;">Following the method of practical application through which it aims to:</p> <p style="padding-left: 80px;">Introduce the student to how to start designing gardens according to the scientific stages.</p> <p style="padding-left: 80px;">The student knows the basic requirements in the garden design process</p>

The student knows how to select and analyze design sites and develop appropriate design proposals for each proposed site, whether private or public gardens or green belts.

Recognize the design programs used to develop proposed designs.

Creating different designs for gardens after selecting different sites, and this is done on A3 paper and then applied on the ground or making miniature models of the proposed designs

Opening the door for discussion to exchange ideas with students, as well as applying the question and answer strategy.

Assigning students homework, writing reports and studies, and conducting field visits.

Conducting daily and monthly theoretical and practical tests.

**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
The first	5	An introduction to landscape design with an explanation of the concepts and terminology used within the discipline	Engineering of Gardens	Explain, present the lecture and conduct the scientific application to frame the A3 canvas space while recognizing the components of the map , symbols and terminology of the garden.	Discuss, ask questions, give examples, and quiz students
Second	5	Levels of Open Space Design	Engineering of Gardens	Explain, present the lecture and conduct the scientific application to recognize the different botanical and structural symbols and how to draw them on the drawing board.	Discuss, ask questions, give examples, and quiz students

Third	5	The stages of open space design, which are four stages	Engineering of Gardens	Explain, present the lecture and conduct the scientific application of how to draw symbols and geometric shapes in the drawing board and apply them on the ground.	Discuss, ask questions, give examples, and quiz students
Fourth	5	Planning criteria for open spaces	Engineering of Gardens	Explain, present the lecture and conduct the scientific application of drawing curved lines in the drawing board and applying them on the ground.	Discuss, ask questions, give examples, and quiz students
Fifth	5	Rules and principles of open space design	Engineering of Gardens	Explain and present the lecture and conduct the scientific application of a typical home garden plan (learn to use the scale, directions and symbols).	Discuss, ask questions, give examples, and quiz students
Sixth	5	Open Space Design Systems	Engineering of Gardens	Explanation and presentation of the lecture and the scientific application of zooming in and out of	Discuss, ask questions, give examples, and quiz students



				maps in the drawing board	
Seventh	5	The basics of using plants in open space design	Engineering of Gardens	Explain and present the lecture and conduct the scientific application of a presentation of some gardens and parks (designed and implemented) from the explanation and presentation of the lecture and conduct the scientific application through movies, pictures and exhibitions of gardens.	Discuss, ask questions, give examples, and quiz students
Eighth	5	Formats for open spaces	Engineering of Gardens	Explain, present the lecture and conduct the scientific application to select a model (a garden in the college) and plan it, draw it and put designs for it in the form of a 2D plan.	Discuss, ask questions, give examples, and quiz students
Ninth	5	Types of open spaces - inside and outside cities (residential complexes,	Engineering of Gardens	Explain and present the lecture and conduct the scientific application to	Discuss, ask questions, give examples, and quiz students

		central islands and squares )		design a garden with certain dimensions and conditions by the students.	
The tenth	5	Open spaces for urban streets (roadsides, in front of buildings, river banks..... etc.)	Engineering of Gardens	Explain and present the lecture and conduct the scientific application to study a computer-aided design program and learn how to draw different two-dimensional designs (D2).	Discuss, ask questions, give examples, and quiz students
eleventh	5	Open spaces with special specifications (such as factories, laboratories, hospitals ..... etc. )	Engineering of Gardens	Explaining and presenting the lecture and conducting the scientific application to study one of the computer-aided design programs and learn how to draw different three-dimensional (3D) designs.	Discuss, ask questions, give examples, and quiz students
Twelveth	5	Green belts (around public roads and around cities)	Engineering of Gardens	Explain and present the lecture and conduct the scientific application of a visit to one of the parks and public gardens.	Discuss, ask questions, give examples, and quiz students

Thirteenth	5	Cost calculations (design, implementation, sustainability, maintenance) for open spaces	Engineering of Gardens	Explain and present the lecture and conduct the scientific application to make miniature models of garden design by the students.	Discuss, ask questions, give examples, and quiz students
Fourteenth	5	Natural and physical components of open spaces	Engineering of Gardens	Explanation and presentation of the lecture and the scientific application of making miniature models of garden design by the students.	Discuss, ask questions, give examples, and quiz students
Fifteenth	5	Natural and physical components of open spaces	Engineering of Gardens	Explanation and presentation of the lecture and conducting the scientific application to hold a competition between the designs prepared by the students (Garden Design and Landscaping Exhibition).	Discuss, ask questions, give examples, and quiz students
<b>Course Evaluation</b>					
Theoretical Tests					
Practical Tests					

Reports and studies	
Field visits	
<b>Learning and Teaching Resources</b>	
<b>Required textbooks (curricular books, if any)</b>	Design and Landscaping, by Abu Dahab Mohammed and Tariq Abu Dahab.
<b>Main references (sources)</b>	Garden Engineering and Design, by Talal Mahmoud Chalabi. Garden Design and Landscaping, by Tarek Mahmoud Al-Qai'i. Foundations of Design, translated by Serop Kendrian
<b>Recommended books and references (scientific journals, reports)</b>	Book Garden Design, by Salvia Crowe Book RESIDENTIAL LANDSCAPE ARCHITECTURE, by Norman K.B. & James E.H. Book Time-Saver Standards for Landscape Architecture by Charles H. & Nicholas D.
<b>Electronic References, Websites</b>	Book Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design, by Norman B. Research and Articles Internet

<b>Course Name:</b>
Farm management
<b>Course Code:</b>
<b>AH1945</b>
<b>Semester / Year:</b>
First semester 2024
<b>Description Preparation Date:</b>
2024
<b>Available Attendance Forms:</b>
regularity (attendance)
<b>Number of Credit Hours (Total) / Number of Units (Total)</b>
75 Hour / 3.5 unit
<b>Course administrator's name (mention all, if more than one name)</b>
Name: Eyid Abbas Abdalltef

**Course Objectives**

**Course Objectives**

- A - Providing the student with the concept of the basic principles of farm management and the economic principles related to them.**
- B - Introducing the student to the most important economic activities and functions required by farm management.**
- C - Introducing the most important types of farms and ways to manage them.**
- D - Introducing the economic criteria and foundations that the farmer adopts in his production.**
- E - Introducing the student to the economic controls to achieve the objectives of farm.**

**Teaching and Learning Strategies**

**Strategy**

A theoretical clarification of the vocabulary of the subject, using data to understand the scientific subject  
 Using graphs in scientific material, student participation in lectures  
 Conduct daily and monthly tests.

**Course Structure**

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	5	Knowledge and understanding Skill for the subject	Elementary concepts of management science.	theoretically Practical vocabulary Subject	Examination, reporting
2	5	Knowledge and understanding Skill for the subject	An introduction to the science of farm management.	theoretically Practical vocabulary Subject	Examination, reporting
3	5	Knowledge and understanding Skill for the subject	Scientific research techniques in farm management.	theoretically Practical vocabulary Subject	Examination, reporting
4	5	Knowledge and understanding Skill for the subject	production costs.	theoretically Practical vocabulary Subject	Examination, reporting
5	5	Knowledge and understanding Skill for the subject	The principle of assigning the best level of production.	theoretically Practical vocabulary Subject	Examination, reporting
6	5	Knowledge and understanding	The principle of equalizing marginal returns.	theoretically	Examination, reporting

		Skill for the subject		Practical vocabulary Subject	
7	5	Knowledge and understanding Skill for the subject	Exam.	theoretically Practical vocabulary Subject	Examination, reporting
8	5	Knowledge and understanding Skill for the subject	The principle of opportunity costs.	theoretically Practical vocabulary Subject	Examination, reporting
9	5	Knowledge and understanding Skill for the subject	substitution principle.	theoretically Practical vocabulary Subject	Examination, reporting
10	5	Knowledge and understanding Skill for the subject	Measures of economic efficiency on the farm	theoretically Practical vocabulary Subject	Examination, reporting
11	5	Knowledge and understanding Skill for the subject	Depreciation and calculation methods.	theoretically Practical vocabulary Subject	Examination, reporting
12	5	Knowledge and understanding Skill for the subject	Factors that cause poor managerial ability.	theoretically Practical vocabulary Subject	Examination, reporting
13	5	Knowledge and understanding Skill for the subject	Farm management methods / substitution method.	theoretically Practical vocabulary Subject	Examination, reporting
14	5	Knowledge and understanding Skill for the subject	Farm management methods / direct comparison method.	theoretically Practical vocabulary Subject	Examination, reporting
15	5	Knowledge and understanding Skill for the subject	Exam.	theoretically Practical vocabulary Subject	Examination, reporting

#### Course Evaluation

Daily exam(5), submission of reports(10), semester exam(35), final exam(50)  
(total score 100)

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Farm Management - Dr. Hashem Alwan Hussein  
University of Baghdad-1998.

Recommended books and references (scientific journals, reports...)	*Lectures of Dr. Iskandar Hussein / College of Agriculture, University of Baghdad, published-2015
Electronic References, Websites	

<b>Course Name: Viticulture and Small Fruits</b>					
Course Code: AH19410					
Semester / Year: Fourth stage / Spring semester / 2024					
Description Preparation Date: 15-2-2024					
Available Attendance Forms: Attendance is according to the lecture schedule					
Number of Credit Hours (Total) / Number of Units (Total) : 30 hours / 5 Units					
Course administrator's name (mention all, if more than one name)					
Name: Prof. Dr. Ahmed Fatkhan Zabar Email: ag.ahmed.fatkhan@uoanbar.edu.iq					
Course Objectives					
<b>Course Objectives</b>		1- Identifying the most important strategic grape varieties growing in the conditions of Iraq. 2- Identify the environmental conditions suitable for the growth of grapes. 3- Learn about the most important ways to grow grapes. 4- Learn about the most important methods of pruning and breeding grapes			
Teaching and Learning Strategies					
<b>Strategy</b>		1- Through lectures. 2- Direct meeting with students (conversations). 3- Scientific trips to different agricultural work sites. 4- Hosting specialized professors to increase the scientific level of students.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2- Modern mobile device 3- Observation	Grapes and their economic importance and nutritional value	Electronic lectures and practical application in laboratories and fields	Questions, discussions and examples

		and field applications			
Second	2	1- Computer 2- Modern mobile device 3- Observation and field applications	Grape classification	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Third	2	1- Computer 2- Modern mobile device 3- Observation and field applications	Preparing a nursery for the propagation of grapes in various ways	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Fourth	2	1- Computer 2- Modern mobile device 3- Observation and field applications	Suitable environment for farming	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Fifth	2	First month exam			
Sixth	2	1- Computer 2- Modern mobile device 3- Observation and field applications	The phenotypic structure of the grape tree	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Seventh	2	1- Computer 2- Modern mobile device 3- Observation and field applications	Annual cycle of grape vine growth	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Eighth	2	1- Computer 2- Modern mobile device 3- Observation and field applications	Grape propagation	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
Ninth	2	1- Computer	Breeding and pruning grapes	Electronic	Questions, discussions



		2- Modern mobile device 3- Observation and field applications		lectures and practical applications in laboratories and fields	and examples
<b>Tenth</b>	<b>2</b>	<b>Second month exam</b>			
<b>Eleven</b>	<b>2</b>	1- Computer 2- Modern mobile device 3- Observation and field applications	Study of the small fruits (strawberry, raspberry, blackberry, blueberry, currant, cosberry, cranberry) in terms of their importance and the appropriate environment for them, their propagation, cultivation and service processes	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
<b>Twelfth</b>	<b>2</b>	1- Computer 2- Modern mobile device 3- Observation and field applications	Methods of cultivation and production of strawberry, raspberry, blackberry, currant, blueberry, cranberry and service and harvest operations	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
<b>Thirteen</b>	<b>2</b>	1- Computer 2- Modern mobile device 3- Observation and field applications	Growing grapes on the slopes in northern Iraq	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
<b>Fourteenth</b>	<b>2</b>	1- Computer 2- Modern mobile device 3- Observation and field applications	Some agricultural service operations for grapes	Electronic lectures and practical applications in laboratories and fields	Questions, discussions and examples
<b>Fifteen</b>	<b>2</b>	<b>Third month exam</b>			
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	
<b>Learning and Teaching Resources</b>	
Required textbooks (curricular books, if a	Al-Saidi, I. H. M. 2000. Production of grapes 2000. College of Agriculture and Forestry - University of Mosul.
Main references (sources)	Al-Saidi, I. H. M. 1982. Cultivation and production of vineyards. College of Agriculture and Forestry - University of Mosul
Recommended books and references (scientific journals, reports...)	Hassan, J. A. and M. A. Salman. The production of grapes 1989. Jabbar Abbas and. College of Agricultural Engineering Sciences - University of Baghdad
Electronic References, Websites	<a href="https://www.tafesa.edu.au/courses/primary-industrie-science/viticulture">https://www.tafesa.edu.au/courses/primary-industrie-science/viticulture</a>  <a href="https://www.extension.iastate.edu/wine/viticulture/">https://www.extension.iastate.edu/wine/viticulture/</a>

<b>Course Name:</b>	<b>Palm Production</b>
Course Code:	<b>AH19411</b>
Semester / Year:	<b>Fourth stage / Spring Semester /2024</b>
Description Preparation Date:	<b>11/2/2024</b>
Available Attendance Forms:	<b>Theoretical and practical lectures according to the weekly schedule Field application for the practical aspect Field visits</b>
Number of Credit Hours (Total) / Number of Units (Total)	<b>30 hours /3.5 unit</b>
Course administrator's name (mention all, if more than one name)	Name: <b>Prof.Dr.Thamer Hameed Reja</b> Email: <b>ag.thamer.hameed@uoanbar.edu.iq</b>
<b>Course Objectives</b>	
<b>Course Objectives</b>	1.Introducing the importance of the date palm, improving its growth, and methods of propagation and processing of the fruits 2. Paying attention to the productivity, development and sustainability of palm groves.

	<p>3. Knowledge of the climatic environment and the appropriate thermal units for each type of palm tree</p> <p>4. Knowing ways to distinguish between palm varieties through the morphological and structural characteristics of the date palm.....</p>
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Teaching and Learning Strategies

<b>Strategy</b>	<p>1. Preparing presentations that explain the basic concepts in the field of horticulture and providing detailed lectures on various topics. Use pictures and illustrations to better illustrate ideas and concepts.</p> <p>2. Organize interactive sessions and workshops that allow participants to actively participate in the learning process. Practical models for growing vegetable plants, orchids or designing and landscaping gardens are presented, and participants are encouraged to participate and apply them in practice.</p> <p>3. Organize field trips to local parks, gardens, nurseries and farms. Explain how to care and maintain it.</p> <p>4. Using multimedia, mobile applications, and educational programs to provide information and interact with students.</p>
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First week	5	The student will be able to learn about the original habitat of the date palm and the origin of the date palm	History of the emergence of the date palm, with morphological description, and nutritional importance.	Botanical classification of the date palm, and important date palm genera from an economic standpoint.	Questions, discussions and examples
Second week	5	The student will be able to identify the thermal units of early, medium and late varieties and the suitability of an area for palm cultivation	Environmental factors suitable for the success of the date palm, thermal units, a visit to palm orchards	Morphological description of the vegetative parts of the date palm.	Questions, discussions and examples

<b>Third week</b>	5	Learn about the general description of the date palm and the genera of date palms	The morphological and structural characteristics of the date palm, the general description of the date palm seed, the structure of the seed	Visit the palm grove and learn about some of the cultivated varieties.	Questions, discussions and examples
<b>Fourth week</b>	5	Learn about the anatomical structure of leaves and how fronds and their parts grow and develop	Formation of leaves and fronds, anatomical structure of the leaf, anatomical structure of the head of the palm, and development of fronds	The anatomical structure of the date palm head and the development of the fronds, stem, roots and branches that occur in the date palm	Questions, discussions and examples
<b>Fifth week</b>	5	Identify the types of flower inflorescences, their differentiation, root structure, and the nature of its growth	Differentiation of inflorescences, roots, root growth, anatomical structure of the date palm fruit	The anatomical structure of the date palm head and the development of the fronds, stem, roots and branches that occur in the date palm	Questions, discussions and examples
<b>Sixth week</b>	5	Identify the differentiation of floral inflorescences, roots, root growth, and the anatomical structure of the date palm fruit	the differentiation of floral inflorescences, roots, root growth, and the anatomical structure of the date palm fruit	Distinctive characteristics of the nature of root formation in the date palm, the anatomical structure of the roots of the date palm	Questions, discussions and examples
		Learn about the types of	Flowering, pollination,	Flowering, pollination,	Questions, discussions

<b>Seventh week</b>	5	insemination and how to perform the insemination and fertilization process	fertilization and establishment of the date palm, the formation and appearance of the inflorescence, the timing of pollination, the effect of the source of the pollen,	fertilization and establishment of the date palm, the formation and appearance	and examples
<b>Eighth week</b>	5	Method of propagation, how to distinguish between seed palms and cuttings, reasons for failure, and how to plant and succeed the cuttings	Methods of palm reproduction, seeds, vegetative method, cuttings separation, morphological description of the inflorescence and its parts in the date palm.	The process of planting offshoots and rooting shoots	Questions, discussions and examples
<b>Ninth week</b>	5	Method of propagation, how to distinguish between seed palms and cuttings, reasons for failure, and how to plant and succeed the offshoots	Methods of palm reproduction, seeds, vegetative method, offshoots separation, morphological description of the inflorescence and its parts in the date palm	Morphological description of the inflorescence and its parts in the date palm, structure and characteristics of female and male flowers, characteristics of pollen and male flowers, characteristics of pollen and female flowers, emergence and development of flower buds.	Questions, discussions and examples
<b>Tenth week</b>	5	Learn about irrigation techniques, adding	Service operations, irrigation, fertilization, the	Morphological description of the inflorescence and its parts in the	Questions, discussions and examples

		fertilizers, and application times	effect of temperature and humidity, breeding and pruning, methods of thinning, concentration and thinning.	date palm, structure and characteristics of female and male flowers, characteristics of pollen and male flowers, characteristics of pollen and female flowers, emergence and development of flower buds	
<b>Eleventh week</b>	5	(Second month exam) Service operations, irrigation, fertilization, the effect of temperature and humidity, breeding and pruning, methods of thinning, concentration and thinning.	(Second month exam) Service operation, irrigation, fertilization, the effect of temperature and humidity, breeding and pruning, methods of thinning, concentration and thinning.	Pollen grains, composition and recipes of date palm pollen, the effect of temperature and humidity on pollen germination, examining the vitality and germination of pollen grains.	Questions, discussions and examples
<b>Twelveth week</b>	5	The possibility of identifying and diagnosing date palm infestations, both insect and pathogenic	Palm diseases, bacterial diseases, non-bacterial diseases, insects that infect the fruits, morphological description of the fruiting stem.	Conducting various tree service operations.	Questions, discussions and examples
<b>Thirteenth week</b>	5	The possibility of identifying and diagnosing date palm infestations, both insect and pathogenic	Palm diseases, bacterial diseases, non-bacterial diseases, insects that infect the fruits, morphological description of the fruiting stalk	Conducting various tree service operations.	Questions, discussions and examples

<b>Fourteenth week</b>	5	The possibility of identifying and diagnosing date palm infestations, both insect and pathogenic	Palm diseases, bacterial diseases, non-bacterial diseases, insects that infect the fruits, morphological description of the fruiting stalk	Morphological description of the fruit stem and fruit, anatomical structure, and chemical composition of the fruits.	Questions, discussions and examples
<b>Fifteenth week</b>	5	Possibility of identifying commercial date palm cultivars as much as possible	cultivars of dates, distinguishing the varieties, and distinguishing characteristics of the cultivars.	Botanical classification of the date palm, and important date palm genera from an economic standpoint.	Questions, discussions and examples

#### Course Evaluation

- 1- Monthly written exams.
- 2- Direct oral exams and field work in the college's fields.
- 3- Through classroom activities and tests.

#### Learning and Teaching Resources

Required textbooks (curricular book any)	1. Al-Bakr, Abdul-Jabbar. 1972. The date palm, its past, its present, and what is new in its agriculture, industry, and trade. Al-Ani Press Baghdad - Iraq.
Main references (sources)	- Guide to Nutrient Deficiency on Date Palms (Prof. Dr. Abdel Baset Odeh Ibrahim - Date -Palm Specialist Dr. Abdel Aziz Nayan - Regional Coordinator Arshengatian - Activities Coordinator) - Organic palm cultivation (Prof. Dr. Khalid bin Nasser Al-Rudaiman)
Recommended books and references (scientific journals, reports...)	- Palm cultivation and date quality (Prof. Abdel Basset Odeh) - Ghaleb Hossam Ali. 1980. Practical palm cultivation.. Matar, Abdul Amir Mahdi. 1991. Palm cultivation and production.
Electronic References, Websites	

<b>Course Name:</b>					
Biotechnology					
Course Code:					
AH19412					
Semester / Year:					
Semester					
Description Preparation Date:					
1 / 11/ 2023					
Available Attendance Forms:					
Theoretical material is given 65%. Practical material is given 35%					
Number of Credit Hours (Total) / Number of Units (Total)					
30 hours / Units 3.5					
Course administrator's name (mention all, if more than one name)					
Name: Dr. Idrees Hussein Mola Salih Email: <a href="mailto:idresshussein@uoanbar.edu.iq">idresshussein@uoanbar.edu.iq</a>					
Course Objectives					
<b>Course Objectives:</b>					
- The student gets to know biotechnology and its importance in terms of application.			.....		
- Knowing the theoretical principles and basics related to the scientific material, the genetic material (DNA).			.....		
- Complete understanding of how DNA and RNA replicate.			.....		
- The student will know how proteins are formed					
- The student will learn about the methods of gene transfer into cells.					
Teaching and Learning Strategies					
<b>Strategy:</b>					
1- Follow the lecture method and use modern presentation methods.					
2- Conduct laboratory experiments.					
3- Direct dialogue with students by asking them questions.					
4- Homework assignments (writing scientific reports).					
5- Learning through applied laboratory work					
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Definition biotechnology, concepts, a historical overview and applications various fields	Electronic lectures and application laboratories fields	Questions, discussions and examples



Second	2	1- Computer 2-Modern mobile device 3-Observations and field applications	The nature of gene material in the nucleus, chloroplast and mitochondria	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Third	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Cutting and joining DNA by cutting and ligating enzymes	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Fourth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Cloning vectors (plasmids, cosmids, phages)	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Fifth	2	First month exam				
Sixth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Cloning strategies plants and hybrid DNA formation	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Seventh	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Genetic transformation plants mediated Agrobacterium bacterium tumefaciens	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Eighth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Genetic transformation in plants by direct ge transfer	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Ninth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	DNA multiplex cha reaction (PCR) and applications	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Tenth	2	Second month exam				
Eleven	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Using DNA indicat to detect mutant a genetically modifie plants	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Twelfth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Preserving genetic resources and freezing germ plas	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples

Thirteen	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Genetic engineering its importance and applications in the production of genetically modified plants (GMPs)	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Fourteenth	2	1- Computer 2-Modern mobile device 3-Observations and field applications	Summary biotechnology lectures	Electronic and application laboratories fields	lectu pract	Questions, discussions and examples
Fifteen	2	Third month exam				
Course Evaluation						
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.						
Learning and Teaching Resources						
Required textbooks (curricular books, if any)			1- Al-Bakri, Ghaleb Hamza.1991. Principles of genetic engineering. Dar Al-Hekma Press. Albasrah university . Iraq. 2- Muhammad, Abdul Muttalib Sayyid and Omar, Mubasher Saleh. 1990. The main concepts in the cultivation of plant cells, tissues and organs. Directorat of Dar Al-Kutub for Printing and Publishing, University Mosul. Iraq .			
Main references (sources)			Abdul Kader, A., Abou Sleymane, G., Khatib. F., Sake and Baum, M. 2011. Laboratory manual for the train course on: Detection of Genetically Modified Organism and Biosafety for Food and Agriculture			
Recommended books and references (scientific journals, reports...)			Moneim, Fawza. 2005. Biosafety in clinical laboratories. Journal of laboratory diagnosis. Volume 3. Issue 8, Faculty of Pharmacy, Damascus University. Syria			
Electronic References, Websites						

<b>Course Name:</b>
<b>Harvesting and storing fruits</b>
Course Code:
AH19413
Semester / Year:
Semester / 4 <sup>th</sup> stage/ 2024
Description Preparation Date:
1 / 1/ 2024
Available Attendance Forms:
Presence in the college according to lectur's secdule

Number of Credit Hours (Total) / Number of Units (Total)
30 hours / Units 3.5
Course administrator's name (mention all, if more than one name)
Name: Ass.prof.Dr. Ali Ammar Ismaeel Email: <a href="mailto:ali.ammar@uoanbar.edu.iq">ali.ammar@uoanbar.edu.iq</a>
Course Objectives

identifying the most important strategic of storage of horticultural crops in the conditions of Iraq
Study the importance of lost of weight during storage
Study the fruit ripening and relationship with plant hormones
Study the artificial ripening of fruits before and after harvest
Study the respiration of fruits and ethylene production
Study the chemical ingredient and Nutritional value of fruits and relationship with storage period
Study the harvesting , sorting, grading , packaging and storage ways of horticultural crops
Study the diseases that affect the horticultural crops during cold storage
Study the technique of flower storage

Teaching and Learning Strategies
<p><b>Strategy:</b></p> <ol style="list-style-type: none"> <li>1- Follow the lecture method and use modern presentation methods.</li> <li>2- Conduct laboratory experiments.</li> <li>3- Direct dialogue with students by asking them questions.</li> <li>4- Homework assignments (writing scientific reports).</li> <li>5- Learning through applied laboratory work</li> <li>6- visiting the cold stores</li> <li>7- student do differential experiments about storage of varies vegetables and fruits</li> </ol>

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

First	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> The economic importance of storage and the amount of loss resulting from it. <b>Practical</b> Anatomical and morphological characteristics of the types of fruits</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions, examples, quizzes and exams</p>
Second	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> Growth and ripening of fruits and the relationship of plant hormones <b>Practical</b> Studying the natural and chemical properties of fruits</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions, examples, quizzes and exams</p>
Third	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> Physiological and chemical changes that occur to fruit upon ripening and storage <b>Practical</b> Ripening and maturity indices</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions, examples, quizzes and exams</p>

<b>Fourth</b>	<b>5</b>	<b>1- Computer</b> <b>2-Modern mobile device</b> <b>3-Observations and field applications</b>	<b>Theory</b> <b>Criteria of completed growth, ripening and determining the date of harvest</b> <b>Practical</b> Study the changes in hardness and pectins of fruits	Electronic lectures and practical application in laboratories and fields	Questions, discussions examples, quizzes and exams
<b>Fifth</b>	<b>5</b>	<b>1- Computer</b> <b>2-Modern mobile device</b> <b>3-Observations and field applications</b>	<b>Theory</b> <b>Respiratory mechanics of fruits during growth and ripening</b> <b>Practical</b> Studying the changes in the organic acid content and acidity of fruits	Electronic lectures and practical application in laboratories and fields	Questions, discussions examples, quizzes and exams
<b>Sixth</b>	<b>5</b>	First month exam			

Seventh	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> Ripening fruits artificially before and after harvest <b>Practical</b> Study of the change in the vitamin C content of fruits</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions examples, quizzes and exams</p>
Eighth	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> Cold damage and freezing damage to horticultural crops <b>Practical</b> Study of changes in the plant pigments chlorophyll and carotene</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions examples, quizzes and exams</p>
Ninth	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> Methods of harvesting, sorting, grading, packing, and additional treatments for the fruits <b>Practical</b> Study of the change in fruit respiration during and after storage</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions examples, quizzes and exams</p>

Tenth	5	<b>1- Computer</b> <b>2-Modern mobile device</b> <b>3-Observations and field applications</b>	<b>Theory</b> <b>Pre-cooling methods before shipping and storage</b> <b>Practical</b> <b>Methods to estimate ethylene production in fruits and study the physiological effects of ethylene</b>	Electronic lectures and practical application in laboratories and fields	Questions, discussions, examples, quizzes and exams
Eleven	5	<b>1- Computer</b> <b>2-Modern mobile device</b> <b>3-Observations and field applications</b>	<b>Theory</b> <b>Storage methods (refrigerated storage, tree storage, and ventilated rooms)</b> <b>Practical</b> <b>Artificial ripening of some types of fruits</b>	Electronic lectures and practical application in laboratories and fields	Questions, discussions, examples, quizzes and exams
Twelfth	5	Second month exam			

Thirteenth	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> The use of atomic radiation to reduce damage of horticultural crops during storage <b>Practical</b> Microbial damage to horticultural crops after harvest</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions, examples, quizzes and exams</p>
Fourteenth	5	<p>1- Computer 2-Modern mobile device 3-Observations and field applications</p>	<p><b>Theory</b> Storage in a control atmosphere and storage in low pressure atmosphere <b>Practical</b> Physiological damages that occur to fruit during storage</p>	<p>Electronic lectures and practical application in laboratories and fields</p>	<p>Questions, discussions, examples, quizzes and exams</p>



Fifteen	5	<b>1- Computer</b> <b>2-Modern mobile device</b> <b>3-Observations and field applications</b>	<b>Theory</b> <b>General principles for determining quality degrees, their importance, and factors of deterioration of the qualitative and nutritional value of horticultural crops during storage</b> <b>Practical</b> Reviewing students' experiences about storing some types of fruits and discussing the reports submitted in this regard	Electronic lectures and practical application in laboratories and fields	Questions, discussions examples, quizzes and exams
		Course Evaluation			
1- Monthly exams. 2- Rapid exams . 3- Evaluation through classroom activity. 4- By preparing scientific reports and taking advantage of information networks. 5- Final exams.					
Learning and Teaching Resources					
Required textbooks (curricular books, if a			عناية وخزن الثمار / عبد الاله مخلف و عدنان ناصر مطلوب / 1982		
Main references (sources)					

Recommended books and references (scientific journals, reports...)	Post harvest biology and technology جدة الحاصلات البستنية بعد الحصاد / عبد الاله مخلف العاني / الجزء الأول والثاني
Electronic References, Websites	

<b>Course Name:</b>					
<b>Soil fertility and fertilizers</b>					
Course Code:					
<b>AH19414</b>					
Semester / Year:					
Semester					
Description Preparation Date:					
<b>2021/9/27</b>					
Available Attendance Forms:					
Attendance (theoretical + practical)					
Number of Credit Hours (Total) / Number of Units (Total)					
65 hours / 3.5 units					
Course administrator's name (mention all, if more than one name)					
Name: Bassam Ramadhnan Sarheed Email: ag.bassam.ramadhnan@uoanbar.edu.iq					
Course Objectives					
1. Understanding the principles of soil fertility and know the extent of the plant's need for various nutrients and relationship to plant productivity.			4. Knowing how much, when and how to add these nutrients and in what form (chemical or organic).		
2. The extent of the importance of plant nutrients, the form in which they are found, and the factors affecting their readiness for the plant.			5. Calculating the economic feasibility and cost of added fertilizers, along with raising awareness about reducing the amount of these fertilizers added without affecting the yield.		
3. Assessing the fertility state of the soil and identifying symptoms of deficiency of various nutrients that appear on the plant.					
Teaching and Learning Strategies					
Strategy		1. Traditional means of explanation and clarification. 2. Electronic means of explanation and clarification. 3. Field experiments. 4. Field visits to agricultural fields. 5. Adopting student groups to conduct separate field experiments. 6. Use of various laboratory devices and equipment. 7. Displaying illustrative pictures of the various manifestations of symptoms of element deficiency on plants.			
Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

The first	5	Definition of growth factors affecting it and methods used for fertility evaluation.	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
the second		The foundations of soil and plant relationships, soil fertility, biological readiness + methods used for fertility evaluation	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
the third		The foundations of soil and plant relationships, soil fertility, biological readiness + methods used for fertility evaluation	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
the fourth		The necessary elements for plant growth and their classification + foundations that rely on them: implementing field experiment, potting experiment, evaluate soil fertility	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
Fifth		Nitrogen + Estimating ready quantities of number of macro and micro nutrients	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
VI	First month exam - theoretical and practical				
Seventh		Phosphorus Estimating the ready quantities of a number of macro and micro nutrients	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
VIII		Potassium Estimating the ready quantities of a number of macro and micro nutrients	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
Ninth		Calcium, magnesium, sulfur + estimating ready quantities of number of macro- and micro-nutrients,	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam
The tenth		Micronutrients	Soil fertility and fertilizers	A lecture with explanation and clarification	The exam

eleveth		Beneficial nutrients	Soil fertility fertilizers	A lecture with explanation and clarification	The exam
twelveth		Organic matter in the soil and its importance on soil fertility + Estimation of the organic matter in soil	Soil fertility fertilizers	A lecture with explanation and clarification	The exam
Thirteenth	Second month exam - theoretical and practical				
fourteenth		Soil fertility evaluation methods for estimating fertility status	Soil fertility fertilizers	A lecture with explanation and clarification	The exam
Fifteenth		Soil fertility evaluation methods for estimating fertility status	Soil fertility fertilizers	A lecture with explanation and clarification	The exam
<b>Course Evaluation</b>					
1- Rapid daily tests. 2- Theoretical tests. 3- Practical tests. 4- Research and reports.					
<b>Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)			1-Al-Naimi, Saadallah. 1999 Fertilizers and soil fertility. Ministry of Higher Education and Scientific Research, University of Mosul. -2 Awad, Kazem Mashhout 1999 Fertilization and Soil Fertility, Ministry of Higher Education and Scientific Research, University of Basra. 3 - Havlin, J.L., Tisdale, S.L., Nelson, W. and Beaton, J.D. 2005, Soil Fertility and Fertilizers, 5th edition. USA .		
Main references (sources)			1-Awad, Kazem Mashhout 1999 Fertilization and Soil Fertility, Ministry of Higher Education and Scientific Research, University of Basra. 2 - Page, A.L. et. Al. 1982, Methods of analysis, part 2 2nd Chemical and microbiological properties. Madison		
Recommended books and references (scientific journals, reports...)			1- Al-Ani, Abdullah Najm, 1980, Principles of Soil Science, Ministry of Higher education and scientific research 2- White, R.E, 1979, Introduction to principles and practices of soil science BlackWell scientific publication 3- Page, A.L. et. Al. 1982, Methods of analysis, part 2 2nd Chemical and microbiological properties. Madison		

	microbiological properties. Madison, Wisconsin, USA
Electronic References, Websites	Local, regional and international scientific books and journals concerned with fertility, especially within scientific and virtual libraries.

<b>Course Name: English Language/4</b>					
Course Code: <b>AH19415</b>					
Semester / Year: SECOND / 2023-2024					
Description Preparation Date:1/4/2024					
Available Attendance Forms: DAYLY					
Number of Credit Hours (Total) / Number of Units (Total) 1 HOUER-1 UNIT					
Course administrator's name (mention all, if more than one name)					
Name: Dr.ANMAR NAZAR HASAN Email:ag.anmar.nizar@uoanbar.edu.iq					
Course Objectives English Language/4					
<b>Course Objectives</b>					
Teaching and Learning Strategies					
<b>Strategy</b>	Theoretical 1 hour				
Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
14	1	BScs.	English Language/4	Theoretical	Daily, monthly and semester exams
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

Learning and Teaching Resources

Required textbooks (curricular books, if any)

NEW HEADWAY PLUS

Main references (sources)

Recommended books and references  
(scientific journals, reports...)

Electronic References, Websites

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