Ministry of Higher Education and Scientific Research

University of Kirkuk / College of Agriculture

Department of Soil Sciences and Water Resources

Academic Program and Course Description Guide

Department of Soil Sciences and Water Resources

University of Kirkuk / College of Agriculture

2023 / 2024

Academic Program Description Form

University Name: Kirkuk

Faculty/Institute: Agriculture

Scientific Department: Soil Science and Water Resources

Academic or Professional Program Name: Bachelors in Soil Science and Water Resources

Final Certificate Name: Bachelor's degree in Soil Science and Water Resources

Academic System: Semester

Description Preparation Date: 3 /4/ 2024

File Completion Date: 3 /4/ 2024

جامعة كركوك
كلية الزراعة
قسم علوم التربة والموارد المائية
« الصادرة »
العدد :
التاريخ :

Signature: Salah 2024

Head of Department Name:

Assis Prof.Dr.Salah Jasim Amin

Date: 3 /4/ 2024

Signature:

Assistant Dean for Scientific Affairs and Postgraduate Studies

Prof. Dr. Ammar Qahtan Shannon

Date: 3 /4/ 2024

جامعة كركوك
كلية الزراعة
شعبة ضمان الجودة والاداء الجامعي
University of Kirkuk
College Of Agriculture

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: Ahmed Esam Dawood

Date: 4/4/2024

Signature: Dr. Ahmed Esam

Approval of the Dean

Dr. Osamah I. Ahmed

1. Program Vision

1. Providing an academic environment to help the student learn and develop his culture, and providing the opportunity to develop the faculty's capabilities to fully perform their academic mission.
2. Excellence in education methods to provide society with qualified cadres to develop healthy food production from available natural resources through sustainable agricultural development while preserving the environment and community service, and capable of implementing agricultural policies and competing locally and globally.
3. Activating scientific research for sustainable, high-production agriculture, capable of international competition.
4. The department's participation in agricultural and scientific conferences and in project evaluation
5. Making scientific research results available and providing advice to investors and decision makers.
6. Strengthening guidance channels, community service and development of rural communities.

2. Program Mission

The department's program contributes to achieving the college's mission, which seeks to spread and apply knowledge to efficiently manage available natural resources in order to provide food for the people, preserve the environment, and achieve sustainable agricultural development. The department is also interested in preparing qualified cadres to develop agricultural production and serve the community by conducting applied research to find solutions to community problems in the agricultural field in general and the field of soil and water resources in particular, as well as participating in implementing extension programs to transfer knowledge and the results of applied research and participating with other departments locally, regionally and internationally. To develop the process of education and scientific research.

3. Program Objectives

1. Graduating qualified scientific personnel who hold a bachelor's degree in agricultural

sciences within the specialty of soil sciences and water resources, as well as advanced scientific personnel who hold master's degrees.

2. Develop programs for community service by holding seminars, training and guidance courses in the field of soil and water resources, in cooperation with other state departments related to various agricultural sciences.
3. Contributing to solving the problems that the agricultural sector suffers from, especially within the soil and water axes, through preparing research projects implemented by the scientific staff in the department in particular, or through research projects for postgraduate students.
4. Preparing continuing education programs to follow up on graduates of the Department of Soil and Water Resources Sciences and develop their technical and scientific skills by holding development courses on the latest developments in science in the department's specialty and those wishing to develop their skills in this specialty.
5. Work on developing the department's curricula in cooperation with corresponding departments in Iraq.
6. Adopting educational courses that focus on the student's practical skills to prepare him for the labor market and continue self-learning
7. Conducting applied research in the fields of soil fertility, fertilization, irrigation system technologies, soil surveying and classification, and its microbiology.
8. Maximizing the return from the soil and water unit, with a focus on rationalizing water use and preventing soil and water pollution.
9. Investing in information technology to develop education, research and community service.
10. Implementing a quality program to improve performance rates in education, research, and community service.

4. Program Accreditation

The program seeks to obtain program accreditation.

5. Other external influences

Scientific seminars and workshops, coordination with relevant agricultural departments as well as private sector participation.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	12	15	9.87	Basic
College Requirements	20	51	33.55	Basic
Department Requirements	31	86	56.58	Basic
Summer Training	1			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
	ANCH111	Analytical Chemistry	theoretical	practical
	GEPH112	General Physics	2	3
	PRFI113	Principles Of Field Crops	2	3
	PRAN114	Principles of Animal Production	2	3
First year/first semester	MATH115	Mathematics/ 1	2	–
	HURI116	Human rights	2	–
	ENDR117	Engineering Drawing	–	3
	COAP118	Computer Applications /1	–	3
	ARLA119	Arabic Language	2	–
	ORCH121	Organic Chemistry	2	3
	PRGE122	Principles Of Geology	2	3
	FRPR123	Fruit Production	1	3
First year/second semester	AGEC124	Principles Of Agricultural Economics	2	-
	MATH125	Mathematics /2	2	-
	COAP126	Computer Applications /2	-	3
	LASU127	Land Survey	1	3
	ENLA128	English Language /1	1	-
Second year/first	BICH211	Bio-Chemistry	2	3
	PRSO212	Principles Of Soil Science	2	3

semester	PRST213	Principles Of Statistics	**2**	**3**
	PRMI214	Principles Of Microbiology	**2**	**3**
	SOEC215	Soil Ecology And Meteorology	**2**	**3**
	AGEX216	Principles of Agricultural Extension	**2**	**-**
	COAP217	Computer Applications/ 3	**-**	**1**
	ENLA218	English Language /2	**1**	**-**
	CRBA219	Crimes of Baath Regime in Iraq	**2**	–
Second year/second semester	SOPL221	Soil, Plant And Water Analysis	**2**	**3**
	PRPL222	Principles Of Plant Protection	**2**	**3**
	FAMA223	Farm Machinery And Equipments	**2**	**3**
	VEPR224	Vegetable Production	**1**	**3**
	PLPH225	Plant Physiology	**2**	**3**
	LALE226	Land Leveling	**2**	**3**
	FRED227	Freedom and democracy	**1**	**1**
	COAP228	Computer Applications/ 4	**1**	**-**
Third year/first semester	SOPH311	Soil Physics	**2**	**3**
	SOOR312	Soil Organic matter	**2**	**3**
	SOFE313	Soil Fertility	**2**	**3**
	IRRI314	Irrigation	**2**	**3**
	SOCH315	Soil Chemistry	**2**	**3**
	SOWA316	Soil And Water Pollution	**2**	**3**
	EXDE317	Experimental Designs and Analysis	**2**	**3**
Third year/second semester	RESE321	Remote sensing	**2**	**3**
	SOSA322	Soil Salinity	**2**	**3**
	SOMO323	Soil Morphology	**2**	**3**
	DRAI324	Drainage	**2**	**-**
	SOMI325	Soil Mineralogy	**2**	**3**
	ECNA326	Economics Of Natural Resources	**3**	**-**
	ENLA327	English Language /3	**1**	**-**
Fourth year/first semester	SOSU411	Soil Survey And Classification	**2**	**3**
	SOCO412	Soil & Water Conservation	**2**	**3**
	SOMI413	Soil Microbiology	**2**	**3**
	SOPL414	Soil-Water-Plant Relationships	**2**	**3**
	HYWA415	Hydrology & Water Resources	**2**	**3**
	IRTE416	Irrigation Technology Systems	**2**	**3**
	REPR417	Research Project	**-**	**3**
Fourth year/second	SOMA421	Soil Management And Land	**2**	**3**

semester		Use		
	DESE422	Desertification	**2**	**-**
	PLNU423	Plant Nutrition	**2**	**3**
	FETE424	Fertilizers Technology	**2**	**3**
	LARE425	Land Reclamation	**2**	**3**
	ENLA426	English Language /4	**1**	**-**
	SEMI427	Seminar	**1**	**-**
	REPR428	Research Project	**-**	**3**

8. Expected learning outcomes of the program

Knowledge

1. **Knowledge of theories related to soil science and water resources**
2. **Know and understand methods of surveying, classifying and managing soil and water resources**
3. **Knowledge of soil and water problems, how to conserve soil and water, and reclaim land**
4. **Knowledge of modern irrigation system management technologies**

Skills

1. **Providing the student with the skills of soil surveying, classification, and management**
2. **Providing the student with the skills of diagnosing soil and water problems**
3. **Providing the student with soil conservation and land reclamation skills**
4. **Providing the student with the skills of installing and managing modern irrigation systems technologies**
5. **Providing the student with the skills of using laboratory equipment, examining soil and water samples, and estimating elements**

Ethics

1. **Developing students' sense of responsibility and psychological preparation to bear the burdens placed on their shoulders.**
2. **Developing students' ability to work collectively as effective teams that produce distinctive results.**
3. **Cultivating the spirit of creativity among students and ensuring that they find innovative solutions to various problems.**

Developing the values of keenness and perseverance in completing work to achieve satisfactory results.

9. Teaching and Learning Strategies

1. **Use the method of delivering information through lecture using the whiteboard, data display device, interactive lecture, and displaying educational video clips that provide the opportunity to watch field and laboratory operations.**
2. **Asking students to submit reports on specific topics related to the academic subject**

in order to expand the student's cognitive ability and train him on means of accessing information to keep his information up-to-date in the future.

3. Training students and encouraging them to use logical discussion, express opinions, and inquire.

4. Learning through practical application in laboratories and applied field practices.

10. Evaluation methods

1- Daily exams. 2- Reports. 3- Monthly exams. 4- Practical exams. 5- The final exam, both theoretical and practical. 6- Summer training in government departments and submitting a report

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Soil Science and Water Resources	Soil survey and management			1	
Professor	Agricultural machines	Design of agricultural machinery			1	
Assistant Professor	geology	geophysics			1	
Assistant Professor	Agricultural Extension	environmental Extension			1	
Assistant Professor	Soil Science and Water Resources	Soil Physics			1	
lecturer	Biological	Environment			1	

lecturer	Biological	microbiology			**1**	
lecturer	geology	Sedimentary rock			**1**	
lecturer	Mechanical Engineering cs	Applied Mechani			**1**	
lecturer	law	Criminal law			**1**	
Assistant lecturer	Soil Science and Water Resources	Soil Physics			**1**	
Assistant lecturer	Soil and water resources sciences,	soil surveying and classification			**1**	
Assistant lecturer	Physics	Laser physics			**1**	
Assistant lecturer	geology	geology			**1**	
Assistant lecturer	Horticulture and landscaping	Medicinal and aromatic plants			**1**	
Assistant lecturer	Arabic language	Arabic language			**1**	

Professional Development

Mentoring new faculty members

1. **Holding periodic meetings with new faculty in order to guide them in everything related to the progress of the educational process in the department**
2. **Holding seminars and workshops in order to introduce them to the tasks, duties and work of teaching, in addition to introducing them to the University Service Law, the**

State Employees Discipline Law, and the controls and instructions for academic promotions.

3. Directing and urging them to carry out scientific research for the purpose of gaining scientific experience as well as benefiting from it for scientific promotion.

Professional development of faculty members

1. Support and encourage the participation of faculty members in local and international research projects to support expertise and capabilities.
2. Support and encourage the participation of faculty members in local and international conferences
3. Supporting researchers' sponsorship activities, supporting the motivation of faculty members, and developing scientific laboratories
4. Support and encourage teachers to engage in development courses held by the university and college to increase knowledge of modern learning methods and keep pace with development.

12. Acceptance Criterion

The department develops a plan to accept students according to several criteria, including the department's absorptive capacity and the number of available teaching staff, as well as the availability of material resources and academic supplies that provide a suitable learning environment for students, noting that admission to the college is generally centralized, and then students are distributed among the scientific departments according to a form. The comparison includes the student's grade point average and interest in the relevant department, and based on it, the student is nominated for admission to the department.

13. The most important sources of information about the program

1. Methodical books available in the Free Education Unit.
2. Source books, master's theses, and doctoral dissertations in the college library as well as the department library.
3. Kirkuk University Journal of Agricultural Sciences, published by the college.
4. The Internet

14. Program Development Plan

1. **Working to update the department's courses and curricula periodically and in a way that is consistent with the directions of the ministry, the university, and the college, as well as the requirements of the labor market.**
2. **Working to conclude cooperation agreements with the corresponding departments in the local, Arab and foreign universities in order to exchange scientific experiences.**
3. **Concluding joint cooperation agreements with relevant agricultural departments and institutions for the purpose of exchanging experiences and providing students with the opportunity for scientific visits to the centers, research stations and affiliated laboratories within the practical curriculum, as well as implementing the summer training program for students in those departments and institutions, in addition to finding and providing job opportunities for graduates of the department. As well as providing these institutions with the results of the department's scientific research.**
4. **Taking advantage of agricultural offices and companies in the private sector to utilize their capabilities to enhance the learning process for students in the department, as well as creating job opportunities for graduates.**
5. **Modernizing the department's laboratories by equipping them with the latest laboratory equipment necessary for students' practical laboratory applications.**
6. **Working to fill the shortfall in the number of specialized teaching staff in cooperation with the Deanship of the College and the University Presidency.**

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First year/first semester	ANCH111	Analytical Chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	GEPH112	General Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PRFI113	Principles Of Field Crops	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PRAN114	Principles of Animal Production	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	MATH115	Mathematics/ 1	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	HURI116	Human rights	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ENDR117	Engineering Drawing	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	COAP118	Computer Applications /1	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ARLA119	Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
First year/second semester	ORCH121	Organic Chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PRGE122	Principles Of Geology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	FRPR123	Fruit Production	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	AGEC124	Principles Of Agricultural Economics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	MATH125	Mathematics /2	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	COAP126	Computer Applications /2	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	LASU127	Land Survey	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ENLA128	English Language /1	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Second year/first semester	BICH211	Bio-Chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PRSO212	Principles Of Soil Science	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PRST213	Principles Of Statistics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PRMI214	Principles Of Microbiology	Basic	*	*	*	*	*	*	*	*	*	*	*	*

	SOEC215	Soil Ecology And Meteorology	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	AGEX216	Principles of Agricultural Extension	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	COAP217	Computer Applications/ 3	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	ENLA218	English Language /2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	CRBA219	Crimes of Baath Regime in Iraq	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
Second year/second semester	SOPL221	Soil, Plant And Water Analysis	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	PRPL222	Principles Of Plant Protection	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	FAMA223	Farm Machinery And Equipments	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	VEPR224	Vegetable Production	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	PLPH225	Plant Physiology	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	LALE226	Land Leveling	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	FRED227	Freedom and democracy	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	COAP228	Computer Applications/ 4	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
Third year/first semester	SOPH311	Soil Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	SOOR312	Soil Organic matter	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	SOFE313	Soil Fertility	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	IRRI314	Irrigation	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	SOCH315	Soil Chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*
	SOWA316	Soil And Water Pollution	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*

	EXDE317	Experimental Designs and Analysis	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Third year/second semester	SOOR312	Soil Organic matter	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOFE313	Soil Fertility	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	IRRI314	Irrigation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOCH315	Soil Chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOWA316	Soil And Water Pollution	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	EXDE317	Experimental Designs and Analysis	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	RESE321	Remote sensing	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Fourth year/first semester	SOSU411	Soil Survey And Classification	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOCO412	Soil & Water Conservation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOMI413	Soil Microbiology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOPL414	Soil-Water-Plant Relationships	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	HYWA415	Hydrology & Water Resources	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	IRTE416	Irrigation Technology Systems	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	REPR417	Research Project	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Fourth year/second semester	SOMA421	Soil Management And Land Use	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	DESE422	Desertification	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	PLNU423	Plant Nutrition	Basic	*	*	*	*	*	*	*	*	*	*	*	*

	FETE424	Fertilizers Technology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	LARE425	Land Reclamation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ENLA426	English Language /4	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SEMI427	Seminar	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	REPR428	Research Project	Basic	*	*	*	*	*	*	*	*	*	*	*	*

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

Course Description Form

1. Course Name:

Analytical Chemistry

2. Course Code:

ANCH111

3. Semester / Year:

first semester/first year

4. Description Preparation Date:

2024-3-28

5. Available Attendance Forms:

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

5 hours 3 units

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

Name: Assistant prof :Nahla kamal asaad
Email: a.p.nahlaasaad@uokirkuk.edu.iq

8. Course Objectives

Course Objectives

Teaching the student on the reception (acceptance/receipt development of the student's ability to respond. Valuing

9. Teaching and Learning Strategies

Strategy	• Preparing a student with a brief knowledge of the basic princip on analytical chemistry and their direct relevance. Mission...

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Definition of the student on the science of analytical chemistry Definition of the importance of quantitative chemistry and expression of concentrations with.....	the science of analytical chemistry Definition of the importance of quantitative chemistry and expression of concentrations with...	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
2	2	Student definition. Laws PM, W/W%, V/V% With Mitigation Laws For Worship With	Laws PM, W/W%, V/V% With Mitigation Laws For Worship With Matters	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and

		Matters			scientific reports
3	2	Student definition of Ka and the method of estimating the curves of correction with matters	Ka and the method of estimating the curves of correction with matters	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
4	2	Student's definition of ion balance, hydrolysis theories and pH for acids, bases and salts of both types...	ion balance, hydrolysis theories and pH for acids, bases and salts of both types...	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
5	2	Define the student on the methods of measuring pH and the Ph device with detailed and structured solutions. Prepare it. With...	the methods of measuring pH and the Ph device with detailed and structured solutions. Prepare it. With...	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
6	2		First exam from curriculum start to solutions. perforati		
7	2	Student definition of sedimentary debris and touching on the Moore, Fulhard and Fagen method	sedimentary debris and touching on the Moore, Fulhard and Fagen method	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
8	2	Student definition of weight analysis, oxidation swabs, reductions, oxidation evidence and reductions with issues of...)	weight analysis, oxidation swabs, reductions, oxidation evidence and reductions with issues of...	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
9	2	The student's definition of automated analysis and identification of Lambert Law -per and spectrometer device with matters.	automated analysis and identification of Lambert Law -per and spectrometer device with matters.	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
10	2	Student Definition of Bever Solutions	Bever Solutions...	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
11	2	Student Definition of Weight Analysis	Weight Analysis	Explanation, presentation of the model and lecture and interactive	Oral and written tests, Daily and monthly

				discussion	reports and scientific reports
12	2	Identification Way Moore, Fulhard and Fagen	Way Moore, Fulhard and Fagen	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
13	2	The student's definition of explaining evidence of acid and rules with multiple issues resolved on all topics above	explaining evidence of acid and rules with multiple issues resolved on all topics above	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
14	2	Define the student on the methods of measuring pH and the Ph device with detailed explanation of the organized solutions. and the way they are prepared. With...	the methods of measuring pH and the Ph device with detailed explanation of the organized solutions. and the way they are prepared. With...	Explanation, presentation of the model and lecture and interactive discussion	Oral and written tests, Daily and monthly reports and scientific reports
15		exam			

11. Course Evaluation

1- Theoretical tests
٢- Practical tests
٣- Reports and studies
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Analytical Chemistry
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.for9a.com/courses/%D8%

Course Description Form

1. Course Name:	
General Physics	
2. Course Code:	
GEPH112	
3. Semester / Year:	
first semester/first year	
4. Description Preparation Date:	
31/3/2024	
5. Available Attendance Forms:	
Classroom attendant	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5	
7. Course administrator's name (mention all, if more than one name)	
Name: Susan Ibrahim Hassan **Email: susanih@uokirkuk.edu.iq**	
8. Course Objectives	
Course Objectives	**• Provide students with a basic understanding of physical concepts and their applications** **• Developing scientific thinking skills and creative solutions to problems** **• Students are encouraged to participate in practical experiments and practical activities** **• Enhance their understanding of the concepts and applications of physics in daily life a different fields**
9. Teaching and Learning Strategies	
Strategy	**1. Before starting to memorize information or solve problems, it is best to understand the basic concepts in physics.** **2. Search for various educational resources such as textbooks, educational videos, interactive programs on the Internet, and educational applications.** **3. Solve a variety of problems to apply the concepts the student learns to improve his physical thinking skills.** **4. Conduct practical experiments. Different experiments can help clarify concepts and understand how to apply them in the real world.** **5. Encouraging discussion of concepts and solving problems collectively by asking studer controversial questions.** **6. Daily exams help to review the material regularly to consolidate the concepts in memory**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Describe the properties of each state of matter and explain its behavior. identify the factors that influence the transformation of a substance from one state to another, such as temperature and pressure.	Matter States, General Properties of Matter, Mechanical Properties of Matter	lecture and discussion and Watching some scientific videos	Student discussion, daily exam, solving some examples on the board
2	2	Understand the exact nature of matter and its behavior, and enable them to apply this knowledge in understanding natural phenomena and analyzing chemical reactions and physical transformations.	kinetic theory, molecular dimensions and intervals, Brownian motion	lecture and discussion and Watching some scientific videos	Student discussion, daily exam, solving some examples on the board
3	2	Understand the interactions and properties of substances at the molecular level, enabling them to interpret physical and chemical phenomena more deeply and apply this knowledge in areas such as engineering, chemistry and materials science.	velocity, molecular forces, intermolecular collision, thermal properties of matter	lecture and discussion and Watching some scientific videos	Student discussion, daily exam, solving some examples on the board
4	2	are relationships between pressure and gas volume in different conditions, as well as the effects of compressibility and elasticity on the properties of materials in many fields.	Boyle's Law, Compressibility and Elasticity/Exam	lecture and discussion and Watching some scientific videos	Student discussion, daily exam, solving some examples on the board
5	2	Understand the relationship between force and motion and apply it to solving physical problems in one dimension, in addition to understanding the phenomenon of free fall and the effect of gravity on objects.	Laws of force and motion, laws of motion in one dimension, free fall of bodies	lecture and discussion and Watching some scientific videos	Student discussion, daily exam, solving some examples on the board
6	2	Understand the	About Newton's laws of	lecture and	Student discussion,

		physical foundations of motion and gravity and apply them to solving scientific problems and explanations in various fields.	**motion: the first law of motion, the second law of motion, Newton's law of universal gravitation**	**discussion and Watching some scientific videos**	**daily exam, solving some examples on the board**
7	**2**	**Understand the phenomenon of hydrogen synergy in water, the structure and physical and chemical properties of water molecules and their vital role as a solvent in many biological and chemical processes.**	**Water: molecular structure, hydrogen bonds, and solvent/test properties**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
8	**2**	**The concept of surface tension as a force accumulated on the surface of a liquid. Identify the factors of surface tension such as surface tension and its effect on fluid behavior. Ability to interpret practical applications of surface tension,**	**tension, contact angle, capillary property**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
9	**2**	**The concept of diffusion as a transition phenomenon from the highest concentration to the bottom. Osmotic phenomena as a physical phenomenon describe the transport of substances through a semipermeable membrane.**	**Diffusion, osmotic phenomenon**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
10	**2**	**understand the physical behavior of liquids and the effect of viscosity on flow,**	**Viscosity, Newton's law of viscosity**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
11	**2**	**Understand fluid behavior and pressure in fluids and the effect of various factors on them.**	**Fluid Flow, Fluid Pressure, Poisel's Law**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
12	**2**	**Understand the mathematical steps and processes that lead to Stoke's law and how to apply them.**	**Stoke's law, its derivation and applications**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**

13	**2**	**The ability to use volumetric and gravimetric relationships to solve problems related to gravity, mass and volume. Understand porosity as a measure of empty voids within a given material.**	**Volumetric and Weight Relationships, Body Density, Porosity, Surface Area and Specificity**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
14	**2**	**devices are understood as tools used to convert light into electrical signals that can be understood, analyzed, and interpreted by harmful X-ray generation and applications.**	**Optical Equipment, X-ray**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**
15	**2**	**exam**	**Exam**	**lecture and discussion and Watching some scientific videos**	**Student discussion, daily exam, solving some examples on the board**

11. Course Evaluation

Reports (5%) - Daily exam, participation and attendance (5%) - Monthly exam for the theoretical part (20%) - Monthly exam for the practical part (10%) - Final exam (60%: theoretical part 40% + practical part (20%) .

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	Practical Physics, written by I. Armitage, translated by Dr. Edmond Tobia George, published by the College of Science, University of Mosul.
Main references (sources)	Physics for Scientists and Engineers" Serway and Jewett
Recommended books and references (scientific journals, reports...)	University Physics" Young and Freedman
Electronic References, Websites	KhanAcademy (https://www.khanacademy.org/)

Course Description Form

1. Course Name:

Principles of Field crops

2. Course Code:

PRFI113

3. Semester / Year:

first semester/ fourth year

4. Description Preparation Date:

1/4/2024

5. Available Attendance Forms:

Attendance at lecture is mandatory

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

5 Hours (2 hours theory , 3 hours practical per week) - Number of units (3)

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

Name: Dr.abbas Abdulla taha \ **Email:** abbasabdulla@uokirkuk.edu.iq

8. Course Objectives

Providing agricultural staff specialized in applied agricultural sciences, especially in the field of field crop sciences, who can create job opportunities in the private agricultural sector and begin performing the task without waiting for job opportunities to be provided for them in state institutions.

9. Teaching and Learning Strategies

-follow the lecture methods and use modern presentation methods
-direct dialogue with student by asking them questions
-Assigning student to homework (writing scientific reports)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Cognitive	Learn about the basics of field crop science	Lecture Discussion	Daily attendance and exam
2	5	Cognitive	*Dividing field crops *Advantages of the soil and climate of Iraq	Lecture Discussion	Daily attendance and exam
3	5	Cognitive	Environmental factors affecting the growth of field crops -Heat factor	Lecture Discussion	Daily attendance and exam
4	5	Cognitive	Soil service operations	Visit the fields	Daily attendance and exam
5	5	Cognitive	The relationship of water to field crops	Lecture Discussion	Daily attendance and exam

6	5	Cognitive	Water and land relationships of plants	Lecture Discussion	Daily attendance and exam
7	5	Cognitive	Light and its relationship to crop growth	Lecture Discussion	Daily attendance and exam
8	5	Cognitive	Weeds and ways to combat them	Lecture Discussion	Daily attendance and exam
9	5	Cognitive	Crop service operations	Visit the fields	Daily attendance and exam
10	5	Cognitive	Life factors and their impact on crop production	Lecture Discussion	Daily attendance and exam
11	5	Cognitive	Plant seeds and factors affecting them	Lecture Discussion	Daily attendance and exam
12	5	Cognitive	Agricultural pests that affect field crops	Lecture Discussion	Daily attendance and exam
13	5	Cognitive	Tools used to control agricultural pests	Lecture Discussion	Daily attendance and exam
14	5	Cognitive	Processes of collecting, purifying and storing crop products	Lecture Discussion	Daily attendance and exam
15	5	Cognitive	Harvesting, storing and drying plants	Lecture Discussion	Daily attendance and exam

11.Course Evaluation

Final theoretical exam	Final practical test	Daily theoretical tests	Practical semester tests	Theoretical semester tests
40	20	5	15	20

12.Learning and Teaching Resources

Required textbooks (curricular books, if an	Principles of field crops / Dr. Majeed Mohsen Al-Ansari Dr. Abdul Majeed Ahmed Al-Younes, Dr. Ghanem Saadallah Hasawi, and Dr. Wafqi Shaker Al-Shammaa
Main references (sources)	Scientific journals in agricultural and economic specialties
Recommended books and references (scientific journals, reports...)	International journals within international classifications and standards
Electronic References, Websites	International journals within international classifications and standards

Course Description Form

13. Course Name:	
Principles of Animal Production	
14. Course Code:	
PRAN114	
15. Semester / Year:	
first semester/first year	
16. Description Preparation Date:	
29/3/2024	
17.Available Attendance Forms:	
mandatory	
18.Number of Credit Hours (Total) / Number of Units (Total)	
5Hours / 3 Unit	
19. Course administrator's name (mention all, if more than one name)	
Name: Mohammed Madhi Zinalabidin Email: mehmetmadhi@uokirkuk.edu.iq	
20. Course Objectives	
Course Objectives	• The student gets to know the basic principles of animal production through a brief knowledge of: • The course aims to teach the student how to care for farm animals as well as carry out field operations • Introducing the student to numbering animals, making animal records, and providing fodder caring for newborn animals
21. Teaching and Learning Strategies	
Strategy	Preparing a student with a brief knowledge of the basic principles of animal production through a brief knowledge of: • The economic importance of wealth as well as the identification of products, eggs and breeding Sheep, cattle and buffalo.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Recognize the economic importance Livestock and their relationship With economic integration And the future potential for expanding livestock production in this wealth	Economic importance Livestock and their relationship With economic integration And the future potential for expanding livestock production in this wealth	**Lecture, demonstrations and interactive discussion**	**Oral and written tests, daily and monthly practical tests, and scientific reports**
2	2	Identify the location of agricultural anima (livestock) in the animal kingdom	Agricultural animals (livestock) in the animal kingdom		
3	2	Identifying cows and buffalo - economic importance - international, Arab and local species	Cows and buffalo economic importance - international, Arab and local species		
4	2	Learn about the management and care of dairy cows, beef cows and dual-purpose cows	Management and care of dairy cows, beef cows and dual-purpose cows		
5	2	Exam	Exam		
6	2	Getting to know the buffalo:	Economic importance –		

		economic importance – origin of the buffalo – istribution in the world – production	origin of the buffalo – istribution in the world – production		
7	2	Identifying sheep and goats – methods of classifying them and some international types	Sheep and goats - methods of classifying them and some international types		
8	2	Identifying local species (sheep an goats) and establishing a sheep herd	local species (sheep and goats) and establishing a sheep herd		
9	2	Identifying poultry and its economic importance - and the origins from which it was bred - and classifying poultry in the world	Poultry and its economic importance - and the origins from which it was bred - and classifying poultry in the world		
10	2	Exam	Exam		
11	2	Learn about egg production and meat production	Egg production and meat production		
12	2	Learn about poultry management and care - nutrition - fodder – physiology, reproduction and artificial insemination	Poultry management and care - nutrition - fodder – physiology, reproduction and artificial insemination		

13	2	Identifying fertilization, pregnancy and birth in cows	Fertilization, pregnancy and birth in cows		
14	2	Learn about field operations in dairy and beef cow fields	field operations in dairy and beef cow fields		
15	2	dentify improvement Genetics of farm animals- Camel horses (origin - types - Education methods)	Genetics of farm animals- Camel horses (origin - types - Education methods)		

23. 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

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Principles of Animal Production" writt by: Dr. Muhammad Ali Makki
Electronic References, Websites	

Course Description Form

1. Course Name:
Mathematics 1
2. Course Code:
MATH115
3. Semester / Year:
first semester/first year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Classroom attendant
6. Number of Credit Hours (Total) / Number of Units (Total)
5
7. Course administrator's name (mention all, if more than one name)
Name: Susan Ibrahim Hassan **Email: susanih@uokirkuk.edu.iq**
8. Course Objectives

Course Objectives	**• Acquire the necessary knowledge of the physical object and understand the meanings a whys of each mathematical concept.** **• Apply the steps to solve the mathematical problem by analyzing the problem and developing a solution plan.** **• Helping the student learn more about new sciences in the learning environment.** **• It helps develop deductive thinking, reasoning and contemplation skills.**
9. Teaching and Learning Strategies	
Strategy	**• Encourage students to participate in the lesson by solving problems and interacting wit the materials actively.** **• Providing opportunities for students to apply mathematical concepts in real-life context** **• Creating inspiring and intriguing mathematical challenges to motivate students and encourage them to develop their mathematical skills.** **• Encourage students to work together in groups to solve mathematical problems and discuss ideas.** **• Provide immediate and constructive feedback to students on their performance a understanding of the material.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understand the basic concepts of real numbers and intervals including natural numbers, integers, decimals, and rational numbers.	Real numbers and intervals	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
2	2	Ability to apply mathematical concepts in solving a variety of problems related to linear and quadratic inequalities	Linear and quadratic inequalities	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
3	2	Ability to apply mathematical concepts in solving a variety of problems related to absolute and fractional inequalities	Absolute and Fractional Inequalities	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
4	2	An ability to accurately draw simple functions and understand the relationship between the equation and form of a function.	Drawing simple functions, incrementing and decreasing functions	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
5	2	Understand mathematical patterns related to even, odd, and symmetrical functions, such as symmetry and symmetry.	Even and odd and conflicting functions, some common functions	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
6	2	An ability to apply trigonometric functions in solving practical and realistic problems.	Trigonometric functions, laws of trigonometric functions	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
7	2	exam			
8	2	Develop the ability to analyze geometrically drawn functions, determine their domains and extent, and understand how value changes affect the shape of a graph.	Domain and range of functions drawn (geometrically)	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
9	2	Learn how to determine the range of variability of a function and the set of values it takes.	Domain and range of functions mathematically	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.

10	**2**	**Understand the basics of the ends of functions and apply it effectively in solving mathematical problems.**	**Find the ends of the functions**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
11	**2**	**Learn the concept of continuity of functions and know the conditions necessary for a function to be continuous at a certain point or in a specific set of points.**	**Continuity of functions**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
12	**2**	**Know the derivative in general and understand the mathematical definition of the derivative.**	**Derivation by definition**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
13	**2**	**It helps students understand the laws of derivatives comprehensively and practically and enables them to use them efficiently in solving a variety of mathematical problems.**	**Derivative laws**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
14	**2**	**Knowledge of integration and its importance in mathematics and scientific and engineering applications, including understanding the concept of space under the curve and the area between two curves.**	**Integration**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
15	**2**		**Exam**		

11. Course Evaluation

Daily Exam, Participation and Attendance (5%) + Monthly Exam (35%) + Final Exam (60%)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	Calculus by Thomas
Main references (sources)	Calculus by James Stewart
Recommended books and references (scientific journals, reports...)	Introduction to Mathematical Statistics" by Robert V. Hogg, Joseph W. McKean, and Allen T
Electronic References, Websites	KhanAcademy (https://www.khanacademy.org/)

Course Description Form

1. Course Name:
Human rights and democracy
2. Course Code:
HURI116
3. Semester / Year:
first semester/first year
4. Description Preparation Date:
28/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(2) Hours, Number of units (2)
7. Course administrator's name (mention all, if more than one name)
Name:Assist Prof. Basira Abdullah Ahmed **Email:** baseraabdullah@uokirkuk.edu.iq
8. Course Objectives
To make the student able to recognize human rights in internal laws and international charters, and to become familiar with the concept of democracy, the various systems of elections, and the means of assigning authority
9. Teaching and Learning Strategies
Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The historical stages through which the idea of human rights passed	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	2	Humanrights in constitution documents International human rig documents	Knowledge	lecture	Daily and monthly exam, attendance and reports
3	2	Human rights in Islamic l are political and social, a the state's responsibility	Knowledge	lecture	Daily and monthly exam, attendance and reports

		guarantee them is positive right to life, the right physical integrity, the right privacy,			
4	2	The right to nationality right to abolish slavery a slavery The right to se determination	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	2	Guarantees to prevent attacks on human rights	knowledge	lecture	Daily and monthly exam, attendance and reports
6	2	1-Human rights guarantees in Islamic law	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	2	the right to movement Intellectual rights and freedoms	knowledge	lecture	Daily and monthly exam, attendance and reports
8	2	The concept of freedom, the concept of anarchy, the concept of democracy, the historical development of the concept of democracy in the Mesopotamian civilization	knowledge	lecture	Daily and monthly exam, attendance and reports
9	2	The pillars of democracy, the basic conditions of the democratic system and its characteristics	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	2	Features of the democratic system, types democracy	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	2	Forms of the system: indir democracy, democracy, concept, and manifestations	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	2	Different systems of electio	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

13	2	Democracy applications	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	2	Civil,society,democratic values and its functions	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	2	The report on human rights in Islam comprehended and surpassed all hypothetical trends, ancient and modern	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Human Rights and Democracy / Dr. Ghassan Karim Majhab, Amjad Zein Al-Abidin Tohm
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including
Electronic References, Websites	International journals .

Course Description Form

1. Course Name:
Engineering drawing
2. Course Code:
ENDR117
3. Semester / Year:
First semester /first year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
((3) hours for the practical part, number of units (٢)
7. Course administrator's name (mention all, if more than one name)
Name: MA-NIHAYAT HUSSEIN AMEEN Email: mnas_int@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	1. Introducing a student to general concepts and definitions in drawing. Engineering drawing is considered a language with rules and foundations that can only be practiced by those who have studied it properly. The extent of achievement in it depends on practice and complete accuracy. 2. Introduce the student to the basics of dimensions and basic measurements Skill objectives for introducing the student to examples of dimensions, measurements, projection, and engineering design.

9. Teaching and Learning Strategies

Strategy	Understand all the engineering properties of an entity or product in a clear and correct manner. Through education and full knowledge of the basics and scientific engineering concepts. 2- Presenting questions about the topic to demonstrate students' understanding through their answers 3- Conducting daily and monthly exams, preparing practical reports, and doing descriptive homework assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	**Lectures + exercises and practical**	**. historical overview of the science of**	**Lectures + applications and**	Daily questions + tests

		observations	engineering drawing and its principles Definitions and explanation of scientific terms	drawings	
2	3	Lectures + exercises and practical observations	Representing objects by reducing and enlarging measurements Examples of scale operations	Lectures + applications and drawings	Daily questions + tests
3	3	Lectures + exercises and practical observations	Modern and basic multi-purpose drawing tools Basics of using tools	Lectures + applications and drawings	Daily questions + tests
4	3	Lectures + exercises and practical observations	Identify the types of lines used in engineering drawings, the rules for implementing them, arranging the drawing paper and data table, and writing numbers and letters	Lectures + applications and drawings	Daily questions + tests
5	3	Lectures + exercises and practical observations	Engineering operations (dividing lines and erecting columns), direct drawings, connecting future lines, arcs, and tangents Examples and drawings	Lectures + applications and drawings	Daily questions + tests
6	3	Lectures + exercises and practical observations	Regular polygons, parabolas and ellipses Examples and drawings	Lectures + applications and drawings	Daily questions + tests
7	3	Lectures + exercises and practical observations	Examination	Lectures + applications and drawings	Daily questions + tests
8	3	Lectures + exercises 9and practical observations	Projective drawing/drawing sections parallel to basic levels	Lectures + applications and drawings	Daily questions + tests
9	3	Lectures + exercises and practical observations	Determine the position of the drop on the plate Examples and drawings	Lectures + applications and drawings	Daily questions + tests
10	3	Lectures + exercises and practical observations	(Intersections in projections)	Lectures + applications and drawings	Daily questions + tests

11	3	**Lectures + exercises and practical observations**	**Basic rules for setting dimensions**	**Lectures + applications and drawings**	Daily questions + tests
12	3	**Lectures + exercises and practical observations**	**Geometric perspective – xometric projection**	**Lectures + applications and drawings**	Daily questions + tests
13	3	**Lectures + exercises and practical observations**	**Sectional projections**	**Lectures + applications and drawings**	Daily questions + tests
14	3	**Lectures + exercises and practical observations**	**Rules for drawing engineering sectors**	**Lectures + applications and drawings**	Daily questions + tests
15	3	**Lectures + exercises and practical observations**	**Examination**	**Lectures + applications and drawings**	Daily questions + tests

11. Course Evaluation

Daily and monthly tests

Participate by asking questions and opening scientific discussions related to the academic subject

Student activities through research, reports, and home and class assignments

And illustrations related to the study material

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction to engineering drawing for students of College of Agriculture - Dr. Spokesman Sabri Hassa Mosul University Press
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, US

Course Description Form

1. Course Name:

Computer Applications/1

2. Course Code:

COAP118

3. Semester / Year:

first semester/ first year

4. Description Preparation Date:

28/03/2024

5. Available Attendance Forms:

Mandatory

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

(3) Hours, Number of units (1)

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

Name:Assist Prof. Basira Abdullah Ahmed **Email:** baseraabdullah@uokirkuk.edu.iq

8. Course Objectives

Introducing the student to the components of the computer, explaining the units of information input and graduation, and providing and developing the student's abilities by using the main applications in the computer

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Identifying the computer and its parts, turning the computer on/off	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	3	Computer parts, input/output units, memory, central processing unit	Knowledge	lecture	Daily and monthly exam, attendance and reports
3	3	Central Processing Unit (C.P.U), main functions, motherboard (M/B) and how to communicate with computer parts	Knowledge	lecture	Daily and monthly exam, attendance and reports

4	3	Input units (mouse/keyboard), output units (Monitor), memory (RAM, ROM)	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	3	Secondary memory, hard disk parts, how to store information on the disk, information about the disk	knowledge	lecture	Daily and monthly exam, attendance and reports
6	3	Introduction to the operating system (Windows), application software	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	3	Practical exam (1)	knowledge	lecture	Daily and monthly exam, attendance and reports
8	3	Windows - use the mouse, minimize/maximize windows - close windows, close windows, exit windows	knowledge	lecture	Daily and monthly exam, attendance and reports
9	3	Moving windows from one place to another, controlling window size (width/height), taskbar - date, time	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	3	Organizing the address list - Copying images and texts - Splitting web pages - Printing web pages - Search engines - How to search for information on the network - Using the search button in the toolbar -	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	3	MY COMPUTER Desktop, Create a shortcut icon for an application or file, Recycle Bin - Window Explorer,	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

		Format floppy disks			
12	3	Install files - select/choose folder, create folder - rename, delete file/folder, copy file/folder, move file/folder	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	3	Screen settings - screen saver, change mouse cursor - double transfer speed control	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	3	Software Installation and Uninstallation, Disk Information, Help Request) HELP	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	3	Practical exam (1)	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Basic Principles of Computers/Magdi Abdulla Al-Wahdi/ Fourth Edition 2019
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including
Electronic References, Websites	International journals .

Course Description Form

1. Course Name:

Arabic language

2. Course Code:

ARLA119

3. Semester / Year:

first semester/first year

4. Description Preparation Date:

3/4/2024

5. Available Attendance Forms:

Mandatory

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

1 hour / 1 unit

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

Name: Hemin Khorshid Saeed
Email: hymnsaeed@uokirkuk.edu.iq

8. Course Objectives

Course Objectives	**The course aims to know the parts of speech and what is related to them terms of signs. It also aims to help the student prepare to write a scient research paper, as well as help him learn Arabic topics**

9. Teaching and Learning Strategies

Strategy	Make the student able to know the Arabic language, which includes the most important topics that help the student to prepare accurate scientific research and help the student to know the common errors in official books.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		Sections of speech and what is related to it in terms of Tags			
2		Sections of nominal and verbal sentences			
3		Write the hamza correctly			
4		The difference			

		between dha and dha			
5		The difference between the fatha and marbuta tā’			
6		Numbers in the Arabic language			
7		punctuation marks			
8		Correction of incorrect words			
9		Use movements correctly			
10		Say and don't say			
11					
12					
13					
14					
15					

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

General Arabic language	Human rights, children and democracy
Main references (sources)	Human rights in Islamic law and international law - Human rights and their guarantees, public freedoms and human rights
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Chemistry
2. Course Code:
ORCH121
3. Semester / Year:
Second semester/First year
4. Description Preparation Date:
28/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours of (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Thikra Ahmad Hassan e-mail: thikra.ahmed@uokirkuk.edu.iq
8. Objectives of the decision
Organic chemistry of the second stage deals with the study and determination of physical constants of organic compounds such as the degree of fusion, boiling and others and knowledge of how to purify the organic compound by laboratory methods and how to separate compounds from each other and detect the unknown organic compound by color methods has been interacted between the practical and theoretical aspect of the student to benefit from the greatest amount of information ** Knowledge of this area
9. Teaching and learning strategies
1- describe methods of assigning physical constants to organic compounds such as the degree of fusion ** And boiling. 2- Describe the general methods of purification 3 - Study and identify methods of separation and detection of the unknown organic compound
.١٠

Method of assessment	Way of learning	Name of unit or subject	Required learning outcomes	Hours	The week
Daily and monthly exam, attendance and reports	Lecture	Definition of organic chemistry, its importance and the	Knowledge	5	1

		types of interactions used in it			
Daily and monthly exam, attendance and reports	Lecture	Study of alkane– saturated hydrocarbon compounds	Knowledge	5	2
Daily and monthly exam, attendance and reports	Lecture	Study of unsaturated alkene hydrocarbon compounds	Knowledge	5	3
Daily and monthly exam, attendance and reports	Student groups	Study of saturated and unsaturated hydrocarbon compounds	Knowledge and skill	5	4
Daily and monthly exam, attendance and reports	The lecture	Study of non– alkene hydrocarbon compounds	Knowledge	5	5
Daily and monthly exam, attendance and reports	Lecture	Study of aromatic hydrocarbon compounds	Knowledge and skill	5	6
Daily and monthly exam, attendance and reports	Lecture	The first month exam	Knowledge	5	7
Daily and monthly exam, attendance and reports	Lecture	** Alcohol and methods of preparation	Knowledge	5	8
Daily and monthly exam, attendance and reports	Lecture	** Phenols have their properties and methods of preparation	Knowledge and skill	5	9

Daily and monthly exam, attendance and reports	Lecture	Reactions of alcohol and phenols	Knowledge and skill	5	10
Daily and monthly exam, attendance and reports	The lecture	Aldehydes have their properties and methods of preparation	Knowledge and skill	5	11
Daily and monthly exam, attendance and reports	Lecture	Ketones have their properties, methods of preparation and reactions of aldehydes and ketones	Knowledge and skill	5	12
Daily and monthly exam, attendance and reports	Lecture	Second month exam	Knowledge and skill	5	13
Daily and monthly exam, attendance and reports	Lecture	Carboxylic acids have their properties and methods of preparation	Knowledge and skill	5	14
Daily and monthly exam, attendance and reports	Lecture	The Secretary and the effective group	Knowledge and skill	5	15

11. Evaluation of the decision

Quarterly pursuit score of (40%) distributed (10) scores for daily preparation, participation and reporting, and (30) monthly exam score of two monthly exams per exam (15) score, and the final exam score of (60%)

12. Sources of learning and teaching

Lectures prepared by the teacher based on the relevant books and references.	Required books (methodology, if any)
General organic chemistry Dr. Ahmad Fathi Sayed Ahmed	Principal references (sources)
Iraqi academic scientific journals, including the Journal of Kirkuk University of Science	Recommended books and supporting references (scientific journals, reports...)
International magazines within the Scopas absorbers	Electronic references, Internet sites

Course Description Form

1. Course Name:

Principle of Geology

2. Course Code:

PRGE122

3. Semester / Year:

First semester/ First year

4. Description Preparation Date:

1/ 4 / 2024

5. Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name: Dr. Ali hakeem dohan **Email:** Alihakeem @uokirkuk.edu.iq

8. Course Objectives

The study of geology enables us to know the types of soil, its composition, source and characteristics, discover the sources and depths of groundwater, and establish agricultural canals.

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Introduction to geology - the concept of its origin and branches	knowledge	lecture	Daily and monthly exam, attendance and reports
2	5	Geological phenomena and how they arise	knowledge	lecture	Daily and monthly exam, attendance and reports
3	5	Minerals and their classification methods	knowledge	lecture	Daily and monthly exam, attendance and reports
4	5	Weathering: its types and its relationship to soil formation	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	5	Rock cycle in nature, igneous rocks	knowledge	lecture	Daily and monthly exam, attendance and reports
6	5	Sedimentary rocks	Knowledge, skill and	lecture	Daily and monthly exam, attendance and reports

			attitude		
7	5	Classification of sedimentary rocks	knowledge	lecture	Daily and monthly exam, attendance and reports
8	5	Classification of Metamorphic rocks	knowledge	lecture	Daily and monthly exam, attendance and reports
9	5	Water cycle: surface water	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	5	underground water	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	5	Minerals and natural rocks in Iraq	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	5	Natural resources survey	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	5	The relationship of geology to soil	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	5	Rock erosion	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	5	Transport and deposition of rocks	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The science of geology is of great importance in agriculture and the environment. It helps in studying soil and determining its chemical, physical and mechanical properties. It is concerned with lands and their components. It also helps in understanding the relationship between the geological characteristics of the soil and the plants that can be grown in it.

Moreover, geology helps uncover natural resources such as groundwater, gemstones, precious metals, oil and natural gas, which is the basis for sustainable agriculture and economic growth anywhere.

Geology also helps in studying natural and geographical areas and sites of environmental influence, and helps in identifying activities.

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	**General Geology**, written by Dr. Abdul Hadi Al-Sayegh and Dr. Farouk Al-Omari
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:

Fruit Production

2. Course Code:

FRPR123

3. Semester / Year:

First semester / First year

4. Description Preparation Date:

28/03/2024

5. Available Attendance Forms:

Mandatory

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

(٤) Hours, Number of units (٢)

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

Name: Assist. Prof. Dr. Raad Ahmed Medan **Email:** Raad132@uokirkuk.edu.iq

8. Course Objectives

The course aims to prepare students to graduate with the ability to work in scientific research centers and universities to improve the reality of horticulture in the country. Providing agricultural staff specialized in planting and establishing orchards can create job opportunities in the private agricultural sector and enable them to undertake agricultural work without waiting for work in state institutions.

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention and activate the thinking strategy according to the student's ability, displaying illustrative pictures of various fruits, and learning through applied field practices.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Knowledge and skills	Economic importance of fruit trees	lecture	Daily and monthly exam, attendance and reports
2	4	Knowledge and skills	Factors affecting fruit growth and production	lecture	Daily and monthly exam, attendance and reports
3	4	Knowledge and skills	Multiplication of fruit trees	lecture	Daily and monthly exam, attendance and reports
4	4	Knowledge and skills	Planning and implementing orchard construction	lecture	Daily and monthly exam, attendance and reports
5	4	Knowledge and	Division of fruit	Field scenes at the	Daily and monthly

		skills	trees	agricultural research and experiments station	exam, attendance and reports
6	4	Knowledge and skills	Characteristics of good seeds	lecture	Daily and monthly exam, attendance and reports
7	5	Knowledge and skills	Factors affecting the development of flower buds	lecture	Daily and monthly exam, attendance and reports
8	5	Knowledge and skills	Planning and implementing orchard construction	Field scenes at the agricultural research and experiments station	Daily and monthly exam, attendance and reports
9	5	Knowledge and skills	Windbreaks	lecture	Daily and monthly exam, attendance and reports
10	5	Knowledge and skills	pruning	lecture	Daily and monthly exam, attendance and reports
11	5	Knowledg e and skills	Seed dormancy	lecture	Daily and monthly exam, attendance and reports
12	5	Knowledge and skills	Fertilizing fruit trees	lecture	Daily and monthly exam, attendance and reports
13	5	Knowledge and skills	Fruit ripening	lecture	Daily and monthly exam, attendance and reports
14	5	Knowledge and skills	Methods of harvesting and packing fruits	lecture	Daily and monthly exam, attendance and reports
15	5	Knowledge and skills	Orchard service operations	Field scenes at the agricultural research and experiments station	Daily and monthly exam, attendance and reports

11. Course Evaluation

The grade for the semester endeavor is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (10) grade for the practical semester exams, and (20) for the theoretical semester exams, and the final exam grade is from (60%), and the final practical exam is (20) The final theoretical exam is (40) marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books a references.
Main references (sources)	Deciduous Fruit Production / Written by Jabber Hassan Al Nuaimi, Youssef Fruit production, Ayad Hani Al-Allaf
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:

Principles of Agricultural Economic

2. Course Code:

AGEP124

3. Semester / Year:

Second semester/ First year

4. Description Preparation Date:

28/03/2024

5. Available Attendance Forms:

Mandatory

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

(2) Hours, Number of units (2)

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

Name: Prof. Dr. khattab Abdullah Mohammed **Email:** khattab1981@uokirkuk.edu.iq

8. Course Objectives

The course aims to raise the level of students' knowledge about general concepts in the economy in general and its types, economic systems and the importance of the agricultural sector among other economic sectors, identifying the most important problems facing it and ways to reduce them, and displaying and marketing agricultural commodities.

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	General concepts in economics	knowledge	lecture	Daily and monthly exam, attendance and reports
2	2	Types of economy, economic systems, productive resources	knowledge	lecture	Daily and monthly exam, attendance and reports
3	2	The importance of the agricultural sector	knowledge	lecture	Daily and monthly exam, attendance and reports
4	2	Economic characteristics of contemporary agriculture	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	2	Risk and uncertainty in agricultural work	knowledge	lecture	Daily and monthly exam, attendance and reports

6	2	Production function	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	2	Demand for agricultural commodities and its types	knowledge	lecture	Daily and monthly exam, attendance and reports
8	2	Factors affecting demand for agricultural commodities	knowledge	lecture	Daily and monthly exam, attendance and reports
9	2	Elasticity of demand and its types	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	2	Display agricultural commodities	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	2	Factors affecting the supply of agricultural commodities	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	2	Flexibility of supply and its types	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	2	Agricultural production function	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	2	Economic problems: unemployment	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	2	Economic problems: inflation	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Principles of Agricultural Economics, written by Ali Jadoua Al-Sharaf
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:
Mathematics2
2. Course Code:
MATH125
3. Semester / Year:
2nd semester / First year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Classroom attendant
6. Number of Credit Hours (Total) / Number of Units (Total)
5
7. Course administrator's name (mention all, if more than one name)
Name: Susan Ibrahim Hassan **Email: susanih@uokirkuk.edu.iq**
8. Course Objectives

Course Objectiv	
9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Helps to understand the derivative in general, understand the mathematical definition of the derivative, and solve more advanced equations.	Derived by definition (for advanced equations)	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
2	2	Helps to understand the laws of derivatives in general and the derivative of trigonometric functions.	Laws of Derivative and Derivative of Trigonometric Functions	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.
3	2	Helps to understand analyze, and apply logarithmic and exponential functions effectively	Derivative of logarithmic functions, exponential functions	Solving exercises on the board with participation of student.	Student discussion, board solution, daily exam and homework solutions.

4	**2**	**Learning the basics of implicit derivatives, assimilate these concepts and apply them effectively in solving a variety of mathematical problems,**	**Implicit derivative**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
5	**2**	**Help to use the derivative to calculate the slope of the tangent, know the mathematical concept of the second derivative, how to calculate it, and analyze the behavior of the function at certain points.**	**The equation of slope of the tangent and the second derivative**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
6	**2**	**Introduce students to the properties of the maxima and minima limits.**	**Find the maxima and minima Limits**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
7	**2**		**exam**		
8	**2**	**It helps determine the behavior of a function and its general appearance on the graph to analyze functions and understand their behavior.**	**Convex and Concave Region**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
9	**2**	**Contributes to the development of mathematical, visual and analytical comprehension skills.**	**Drawing Functions**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
10	**2**	**Introduce students to matrices and how to perform mathematical operations such as addition and subtraction.**	**Matrices, Addition and Subtraction of Matrices**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
11	**2**	**It helps students how to get solutions to matrix equations and find unknowns through equality of matrices.**	**Matrix equations (equality of matrices)**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
12	**2**	**It helps the student in understanding matrices, how to represent them, and the addition, subtraction, and multiplication operations related to them.**	**Multiplying matrices**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
13	**2**	**Help Students to gain a**	**Solving more examples**	**Solving**	**Student discussion,**

		good understanding of the concept of matrix multiplication and how to implement it and increase their algebraic arithmetic skills.	**about Multiplying matrices.**	**exercises on the board with participation of student.**	**board solution, daily exam and homework solutions.**
14	**2**	**Help to know the concepts of determinants, including what determinants are, their different types, and how to use them to solve problems.**	**Determinists**	**Solving exercises on the board with participation of student.**	**Student discussion, board solution, daily exam and homework solutions.**
15	**2**		**Exam**		

11. Course Evaluation

Daily Exam, Participation and Attendance (5%) + Monthly Exam (35%) + Final Exam (60%)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Calculus by Thomas
Main references (sources)	Calculus by James Stewart
Recommended books and references (scientific journals, reports...)	Introduction to Mathematical Statistics" by Robert V. Hogg, Joseph W. McKean, and Allen T
Electronic References, Websites	KhanAcademy (https://www.khanacademy.org/)

Course Description Form

1. Course Name:

Computer Applications/2

2. Course Code:

COAP126

3. Semester / Year:

second semester/ first year

4. Description Preparation Date:

28/03/2024

5. Available Attendance Forms:

Mandatory

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

(3) Hours, Number of units (1)

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

Name:Assist Prof. Basira Abdullah Ahmed **Email:** baseraabdullah@uokirkuk.edu.iq

8. Course Objectives

Developing the student's abilities to master making tables and writing mathematical equations via the computer

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Run Microsoft Word - open a new document - save the working page - make a backup copy - close a file - open a stored file	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	3	Inverting the language between Latin and Arabic - preparing an Arabic and Latin paragraph - preview before printing - printing the worksheet - specifying the text - font and size - underlining - changing letter case	Knowledge	lecture	Daily and monthly exam, attendance and reports
3	3	Moving and copying	Knowled	lecture	Daily and monthly exam,

		information - Word clipboard - Search and replace - Numbers and bullets - Spell checker - Undo - Reverse undo - Page setup - Page margins - Text alignment - Line spacing	ge		attendance and reports
4	3	Inserting a table - Inserting rows and columns - Selecting the row/column - Selecting the table - Adding borders and deleting cells - Shading the frame	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	3	Merge and split cells - Split the table - Change the height and width of cells - Auto fit - Repeat the table title - Header and footer - Sorting text	knowledge	lecture	Daily and monthly exam, attendance and reports
6	3	Page numbering - writing code - toolbar - drawing - deleting drawing shapes - filling - drawing line color - inserting, editing, deleting and moving the image	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	3	Microsoft Excel: Run it - Excel worksheet - Enter data - Save the file - Print the worksheet - Exit the program	knowledge	lecture	Daily and monthly exam, attendance and reports
8	3	Practical exam	knowledge	lecture	Daily and monthly exam, attendance and reports
9	3	Selecting cells - types of data - using mathematical formulas to select data - relative and absolute addresses - formulas that produce error values - moving cells - copying data Move or copy a worksheet and replace - move to a cell - delete cells - erase/insert a row or column	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	3	Organizing the address list - Copying images and texts - Splitting web pages - Printing web pages - Search engines - How to search for information on the network - Using the search button in the toolbar -	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11	3	Modify the height of a row or column - show and hide the row or column	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	3	Rename the worksheet - font type, size and style	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	3	Shape numbers - align data - add borders	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	3	Fill cells - sort data - create a chart	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	3	Edit Created Layout - Header/Footer Insert and remove a page break	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11. Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Computer basics and office applications (Part second Ziad Muhammad Aboudi, Ghassan Hamid Abdel Majeed, Mustafa Diaa Al-Hassani
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including
Electronic References, Websites	International journals .

Course Description Plane surveying

1. Course Name:
Land Survey
2. Course Code:
LASU127
3. Semester / Year:
Second semester/first year
4. Description Preparation Date:
2/4/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) Hours, Number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Ali hakeem dohan **Email:** Alihakeem @uokirkuk.edu.iq
8. Course Objectives
Introducing the student to the general basics of surveying and preparing him so that he has the ability to manage surveying technicians and engineers working on civil projects. Introducing the student to using some surveying devices, such as the Level device and the Theodolite device, so that he can perform the simple surveying work he needs in civil works, such as measuring levels or measuring a specific angle. Giving the student priorities for advanced surveys, such as surveying roads and measuring coordinates. This enables the student, if he wishes, to develop his capabilities in the future through courses or study so that he can be a professional surveyor and perform advanced surveying work. Giving the student the basic principles of surveying, training him on the use of surveying tools, and acquiring the following skills: Introduction to various surveying sciences Using modern surveying equipment to obtain meteorology Calculating coordinates and determining locations
9. Teaching and Learning Strategies
Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Definition of space, its types, branches and how it develops	knowledge	lecture	Daily and monthly exam, attendance and reports
2	5	Basic principles of	knowledge	lecture	Daily and monthly exam, attendance and reports

		space Units of measurement (its parts, multiples)			
3	5	scale, (types, methods of application)	knowledge	lecture	Daily and monthly exam, attendance and reports
4	5	Surveying using the measuring wheel (on the map and on the ground)	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	5	Longitudinal measurements and longitudinal measuring tools	knowledge	lecture	Daily and monthly exam, attendance and reports
6	5	Scanning with tape	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	5	Cadastral errors, their types and sources	knowledge	lecture	Daily and monthly exam, attendance and reports
8	5	Methods for measuring horizontal distances directly Knowing the obstacles that prevent measurement	knowledge	lecture	Daily and monthly exam, attendance and reports
9	5	Methods of dropping columns	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	5	Methods of indirect measurement through a device Settlement	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	5	Distance whiskers method and shadow method	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	5	Anvar method	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	5	Settlement methods	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	5	Topographical area	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	5	Application of measuring distances using theodolite	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11.Course Evaluation					
The goals can be summarized through the following points:					

1. Establishing the required locations on the ground based on known points
2. Identify and determine the locations of agricultural lands and their heights above sea level
. 3. Finding land areas according to their types directly or through maps
. 4. Giving an idea about water resources and their distance from agricultural lands
. 5. Assist in designing irrigation and drainage networks and constructing dams and water tanks
6. Planning the locations of agricultural roads of all types and the boundaries of forest divisions
7. Determine the types and densities of vegetation cover in different areas using aerial photographs and remote sensing methods
8. Providing the necessary information for constructing agricultural buildings
9. Providing the necessary information for making contour lines, terraces, and corrugations on slopes
10. Assist in determining the boundaries of soil units when classifying lands.

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Principle of plane and Topographic Surveying written by Dr. Riad Saleh Al-Khafaf
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:
English language 1
2. Course Code:
ENLA128
3. Semester / Year:
second semester/first year
4. Description Preparation Date:
31/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hour
7. Course administrator's name (mention all, if more than one name)
Name: Berevan Qader Omar **Email:** beree.omer@gmail.com
8. Course Objectives
Teaching this curriculum aims to make the student familiar with the English language as an international language that help the student get benefits from it in his scientific life widely .
9. Teaching and Learning Strategies
It is a semi-integrated curriculum for the beginner level that includes the necessary basics for learning English language in a simplified way with exercises. It includes nouns, verbs, interrogatives, adjectives, and adverbs.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introduction to part of speech in English	Knowledge	lecture	Exercise
2	1	Nouns in English	Knowledge	lecture	Exercise
3	1	Singular and plural	Knowledge	lecture	Exercise
4	1	Question words	Knowledge	lecture	Exercise
5	1	Tense of verbs	Knowledge	lecture	Exercise
6	1	Present simple for beginner	Knowledge	lecture	Quiz
7	1	Present continuous for beginner	Knowledge	lecture	Exercise
8	1	Past simple for beginner	Knowledge	lecture	Exercise
9	1	Past continuous for	Knowledge	lecture	Exercise

		beginner			
10	1	adjectives	Knowledge	lecture	quiz
11	1	Pronouns	Knowledge	lecture	quiz
12	1	adverbs	Knowledge	lecture	Exercise
13	1	Adverb of frequency	Knowledge	lecture	Exercise
14	1	Some & any	Knowledge	lecture	Exercise
15	1	Modal verbs	Knowledge	lecture	Quiz

11.Course Evaluation

Semester endeavor (40 marks): 15 marks for the first month exam + 5 marks for quiz
15 marks for second month exam + 5 marks for quiz
Final exam (60 marks)

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	New headway plus (beginner student book written by : john and liz soars
Main references (sources)	Cambridge press
Recommended books and references (scientific journals, reports...)	My English library website
Electronic References, Websites	You tube and some useful websites

Course Description Form

Bio-chemistry
13. Decision code
BICH211
14. Chapter/year
first semester/ Second year
15. Date of preparation of this description
28/03/2024
16. Forms of presence available
Mandatory
17. Number of hours (total)/ number of units (total)
(5) hours of (2) hours for the theoretical part and (3) hours for the practical part, number of units (3)
18. Name of the course administrator (if more than one name is mentioned)
Name: Mohammed Abdul Aziz Lateef email: mahammdazyz@uokirkuk.edu.iq
19. Objectives of the decision
** Have an understanding of the basic topics in biochemistry and their applications in the field of laboratories with appropriate knowledge of the different axes of chemistry.
20. Teaching and learning strategies acquire a reasonable level of chemical knowledge commensurate with what is recognized among the different universities of the world, especially the sober ones.

Method of assessment	Way of learning	Name of unit or subject	Required learning outcomes	Hours	The week
Daily and monthly exam, attendance and reports	Lecture	Biochemistry and its fields The components of the living cell and its functions	Knowledge	5	1
Daily and monthly exam, attendance and reports	Lecture	Carbohydrates – their importance is defined by their sections	Knowledge	5	2
Daily and monthly exam, attendance and reports	Lecture	Single sugars - similar In monosaccharides - the derivatives of monosaccharides - the ring structure of sugars	Knowledge	5	3
Daily and monthly exam, attendance and reports	Student groups	Low–lying polysaccharides – their reduced and unreduced types	Knowledge and skill	5	4

Daily and monthly exam, attendance and reports	Scientific trips to some departments in the province	Many homogeneous and heterogeneous sugars	Knowledge	5	5
Daily and monthly exam, attendance and reports	Lecture	The first month exam	Knowledge and skill	5	6
Daily and monthly exam, attendance and reports	Lecture	Fat – define its importance – fatty acids its sections – their composition – their interactions – geometric similarities to fatty acids	Knowledge	5	7
Daily and monthly exam, attendance and reports	Lecture	Fat sections − simple fats − types (oils, fats and candles) − their composition − fat constants	Knowledge	5	8
Daily and monthly exam, attendance and reports	Lecture	And the shape and shape of the boat – the shape of it	Knowledge and skill	5	9
Daily and monthly exam, attendance and reports	Lecture	Amino acids – their sections – their structures – amino acid properties – their interactions	Knowledge and skill	5	10
Daily and monthly exam, attendance and reports	Student groups	Peptides – proteins – defined by their sections – protein synthesis levels – denera	Knowledge and skill	5	11
Daily and monthly exam, attendance and reports	Lecture	Second month exam	Knowledge and skill	5	12
Daily and monthly exam, attendance and reports	Lecture	Nucleic acids – their importance as nucleotides – their functions – their composition – types of nucleic acids	Knowledge and skill	5	13
Daily and monthly exam, attendance and reports	Lecture	Enzymes – defined – the mechanism of action of the enzyme – classified – inert and active enzymes – factors	Knowledge and skill	5	14

		affecting the speed of the enzymatic reaction			
Daily and monthly exam, attendance and reports	Lecture	Explain the lock and key theory	Knowledge and skill	5	15

21. Evaluation of the decision

Quarterly pursuit score of (40%) distributed (10) scores for daily preparation, participation and reporting, and (30) monthly exam score of two monthly exams per exam (15) score, and the final exam score of (60%)

22. Sources of learning and teaching

Lectures prepared by the teacher based on the relevant books and references.	Required books (methodology, if any)
Chemical by the Dalai Lama	Principal references (sources)
Iraqi academic scientific journals, including the Journal of the University of Kirkuk for Chemical Sciences Biochemistry and its fields _	Recommended books and supporting references (scientific journals, reports...)
International magazines and Scopas absorption magazines	Electronic references, Interne sites

Course Description Form

1. Course Name:

Principles of soil science

2. Course Code:

PRSO212

3. Semester / Year:

First Semester / Second Year

4. Description Preparation Date:

1/4/2024

5. Available Attendance Forms:

Mandatory

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

(5) hours (2) hours for the theoretical part and (3) hours for the practical part, the number of units (3)

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

Name: Prof. Dr. Dalshad Rasool Azeez
Email: dr_dalshad@uokirkuk.edu.iq
Assist. Lecturer.Noorjan Essmat Noori
essmat.noorjan@uokirkuk.edu.iq

8. Course Objectives

Course Objectives

1- Introducing the student to the role of each component of the soil in the development of the soil.
2- Knowledge of soil formation factors and processes.
3- The importance and role of agricultural soil.

9. Teaching and Learning Strategies

Strategy	The course includes the concepts of the soil and its main components, soil factors and processes, and the study of its physical properties (soil structure - soil texture - bulk and real density - porosity - soil color - soil temperature - soil air) and chemical properties (soil solution - acidity - salinity - organic matter content - fertility)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Cognitive	Soil concepts and main soil components	Lecture	Daily and monthly exam, attendance and reports
2	5	Cognitive	Rock weathering / soil formation factors and processes	Lecture	Daily and monthly exam, attendance

					and reports
3	5	Cognitive	Main soil horizons / profile and soil pedoun	Lecture + Field Visit	Daily and monthly exam, attendance and reports
4	5	Cognitive	Physical properties of soil / soil texture	Lecture + Laboratory	Daily and monthly exam, attendance and reports
5	5	Cognitive	Soil construction (soil structure	Lecture + Laboratory	Daily and monthly exam, attendance and reports
6	5	Cognitive	Soil Water/Water Constants/Physics Classification of Soil Water	Lecture + Laboratory	Daily and monthly exam, attendance and reports
7	5	Cognitive	Bulk and particale density of soil - porosity	Lecture + Laboratory	Daily and monthly exam, attendance and reports
8	5	Cognitive	Soil color/soil air/soil temperature	Lecture + Laboratory	Daily and monthly exam, attendance and reports
9	5	Cognitive	Chemical properties of soil / soil solution / degree of soil reaction	Lecture + Laboratory	Daily and monthly exam, attendance and reports
10	5	Cognitive	Cationic exchange capacity/base saturation ratio	Lecture	Daily and monthly exam, attendance and reports
11	5	Cognitive	Soil colloids/absorption and adsorption	Lecture	Daily and monthly exam, attendance and reports
12	5	Cognitive	Soil salinity and reclamation of soils affected by salts	Lecture + Laboratory	Daily and monthly exam, attendance and reports
13	5	Cognitive	Soil fertility and plant nutrition	Lecture + Laboratory	Daily and monthly exam, attendance and reports
14	5	Cognitive	Organic soil matter	Lecture + Laboratory	Daily and monthly exam, attendance and reports
15	5	Cognitive	Biological properties of the soil	Lecture + Laboratory	Daily and monthly exam, attendance and reports

11. Course Evaluation

The degree of quarterly pursuit of (40%) distributed (5) degrees for daily preparation, participation and reporting, and (25) degrees of theoretical monthly exams by two monthly exams, and (10) degrees of practical monthly exams by two monthly exams and the final exam score of (60%) distributed (40) degrees for the theoretical part and (20) degrees for the practical part.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Principles of Soil Science - authored by Dr. Abdullah Najm Al-Ani 1980 Al-Bashour, Methods of Soil Analysis of Arid and Semi-Arid Areas, authored by Essam Al-Bashour and Antoine Al-Sayegh.2007.
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International magazines within Scopus containers

Course Description Form

1. Course Name:

Principles of Statistics

2. Course Code:

PRST213

3. Semester / Year:

First semester/second year

4. Description Preparation Date:

31/03/2024

5. Available Attendance Forms:

Mandatory

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

Theory=(2) Hours & Practical = (3) Hours , Number of units (3)

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

Name: Dr. Salah Jasim Amin **Email:** dr.salahjasim@uokirkuk.edu.iq

8. Course Objectives

The course aims to introduce students to the principles of statistics and its types, how to display tables and graphical representation of data, as well as to identify the most important statistical methods used (measures of central tendency and dispersion, etc.) and to make the student able to use different statistical methods correctly to solve statistical problems, as well as to analyze data statistically

9. Teaching and Learning Strategies

Explanation and clarification
lecture method
student groups.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	knowledge	Introduction to statistics, its definition, and its divisions	lecture	Exam
2	5	knowledge	The nature of statistical data and symbols	lecture	Exam
3	5	Knowledge & skills	Tabular display and graphical representation	lecture	Exam
4	5	Knowledge & skills	Tabular display and graphical representation	lecture	Exam

5	5	Knowledge & skills	measures of central tendency (arithmetic mean and harmonic mean) for ungrouped data and classified data	lecture	Exam
6	5	Knowledge & skills	measures of central tendency (median, mode) for ungrouped data and classified data	lecture	Exam
7	5	Knowledge & skills	measures of central tendency (geometric mean, square mean) for ungrouped data and classified data	lecture	Exam
8	5	Knowledge & skills	Measures of absolute dispersion (range, mean deviation)	lecture	Exam
9	5	Knowledge & skills	Measures of absolute dispersion (variance, standard deviation)	lecture	Exam
10	5	Knowledge & skills	Measures of relative dispersion: (coefficient of variation)	lecture	Exam
11	5	Knowledge & skills	Torsion measures and oblate measures	lecture	Exam
12	5	Knowledge & skills	Hypothesis testing	lecture	Exam
13	5	Knowledge & skills	t distribution	lecture	Exam
14	5	Knowledge & skills	Chi-square distribution	lecture	Exam
15	5	Knowledge & skills	Simple regression and correlation	lecture	Exam

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction to Statistics, written by Dr. Khasha Mahmoud Al-Rawi (1989)
Main references (sources)	Introduction to descriptive statistics, written b Prof. Dr. Muhammad Ahmed Shalabi
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals
Electronic References, Websites	Different sites on the Internet

Course Description Form

23.Course Name:
Principle of Microbiology
24.Course Code:
PRMI 214
25.Semester / Year:
first semester/second year
26.Description Preparation Date:
03/04/2024
27.Available Attendance Forms:
Mandatory
28.Number of Credit Hours (Total) / Number of Units (Total)
(5) Hours, Number of units (3)
29.Course administrator's name (mention all, if more than one name)
Name: Dr. kawther hkeem ibraheim **Email:** microbiology_1975@uokirkuk.edu.iq
30.Course Objectives
The course aims to raise the level of students' knowledge about the microbiology projects and how to distinguish between them practically and culturing with acknowledging how characterization laboratory.
31.Teaching and Learning Strategies
Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects.
32. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	- Introduction to microbiology - Know general aspect of microbiology Know the important scientists contributed in development of microbiology	Introduction and the historical development of microbiology	lecture	Daily and monthly exam, attendance and reports- Making quizzes - Discussion
2	5	- How to classifying bacteria - Know the general structure of bacteria Know the physiology of bacteria	The classification of microorganisms Nutritional requirements of bacteria	lecture	Daily and monthly exam, attendance and reports
3	5	Microbial control Sterilization and	- Know the different types of microbial	lecture	Daily and monthly

		Disinfection	control How to use the sterilization techniques for medical equipments		exam, attendance and reports
4	5	Structure of bacteria components	knowledge	Lecture.working in lab as group	Daily and monthly exam, attendance and reports
5	5	Classification of bacteria	Classification of bacteria depending on family,class,order,genus	Lecture working in lab as group	Daily and monthly exam, attendance and reports
6	5	History,Classification of fung	Intensive study fungi.structure,nutartion ,physiology	Lecture working in lab as group	Daily and monthly exam, attendance and reports
7	5	History ,Classification of yeast	Intensive study fungi.structure,nutrition ,physiology	Lecture working in lab as group	Daily and monthly exam, attendance and reports
8	5	History ,Classification of algae	Intensive study fungi.structure,nutrition ,physiology	Lecture working in lab as group	Daily and monthly exam, attendance and reports
9	5	History ,Classification of protozoa	Intensive study fungi.structure,nutrition ,physiology classification,Knowledge, skill	Lecture working in lab as group	Daily and monthly exam, attendance and reports
10	5	History ,Classification of virus	Intensive study fungi.structure,nutrition ,physiology,classification Knowledge, skill	Lecture working in lab as group	Daily and monthly exam, attendance and reports
11	5	Control of microorganism	Factores on microorganism growth,control,prevention	Lecture working in lab as group	Daily and monthly exam, attendance and reports
12	5	antibiotic	Study types of antibiotics ,classification act work with site effects on it	Lecture working in lab as group	Daily and monthly exam, attendance and reports
13	5	pathogensis	Doses of effect and type	Lecture	Daily and

			of toxins for each bacteria and workss	working in lab as group	monthly exam, attendance and reports
14	5	Microorganism in food	Study types of microogransim with acts in food and benefits and dis advantages	Lecture working in lab as group	Daily and monthly exam, attendance and reports
15	5	Micro in water,air,industraial	Types and classification for each one and works and distribution in enviroments and works	Lecture working in lab as group	Daily and monthly exam, attendance and reports

33.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

34.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Whitman, William B; Rainey, Fred; Kämpfer, Peter; Trujillo, Martha; Chun, Jonsik; Devos, Paul; Hedlund, Brian; Dedysh, Svetlana (eds.) (2015). *Bergey's Manual of Systematics of Archaea and Bacteria*. John Wiley and Sons. 4- Richard A. Harvey, Cynthia Nau Cornelissen and Bruce D. Fisher. Microbiology. (Lippincott's Illustrated Reviews) 3rd edition. 2014 5- Bailey and Scott's.(2014). Diagnostic microbiology.Elseiver,2014. 6-- Brock TD.Madigan M. Martinko J. et al.editors: Biology of microbiology. Upper Saddle River, NJ.2009. Prentice Hall
Recommended books and references (scientific journals, reports...)	**Web sites of Microbiology**

Course Description Form

1. Course Name:
Soil Ecology And Meteorology
2. Course Code:
SOEC215
3. Semester / Year:
first semester /second year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, numb of units (٢)
7. Course administrator's name (mention all, if more than one name)
Name: Sameerah Faydhllah MOHAMED Email: soil_70@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	• Researches the soil environment and atmospheric conditions in ecology, ecosystem and environmental factors • It includes the living and non-living components of an ecosystem • the soil • Temperature, humidity, rain and light • Condensation and wind • Pollution, desertification and global warming
9. Teaching and Learning Strategies	
Strategy	• Brainstorming • Thinking strategy according to the student's ability, for example (if the student is able to learn analysis methods, he will acquire skill in linking knowledge of the soil's chemical and physical properties and fertility. • Critical Thinking strategy in learning, which is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to reach the desired solution.3- Conduct daily and monthly examinations and prepare practical reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	The student gets an introduction to ecology and the ecosystem	**Environmental science, surrounding factors, and learning about the most important laboratory equipment**	Explanation and display of pictures and Lecture	**Examination**
2	2+3	The student gets to know the types of ecosystems and soil factors	**Temperatures and devices for measuring temperature in the air and soil**	Explanation and display of pictures and Lecture	**Examination**
3	2+3	For the student to learn about the importance of biological water and the division of plants according to their need for water, rain, and their effectiveness	**Solar radiation and measuring devices**	Explanation and display of pictures and Lecture	**Examination**
4	2+3	The student gets to now condensation and frost	**Humidity and devices for measuring it in the air and soil**	Explanation and display of pictures and Lecture	**Examination**
5	2+3	**The student gets to know the temperature and thermal range of plants and the effect of heat stress**	**Precipitation, rain and dew measuring devices**	Explanation and display of pictures and Lecture	**Examination**
6	**Examination**	**The student will be familiar with the nature of thermal stress, the effect of heat on vegetation, thermal synchrony, and ambient temperature**	**Wind, devices for measuring wind speed and direction**	Explanation and display of pictures and Lecture	**Examination**
7	2+3	**The student gets to know light and the biological effects of light**	**Atmospheric pressure and measuring devices**	Explanation and display of pictures and Lecture	**Examination**
8	2+3	**The student gets to now the point of photocompensation and the effect of light on the shape**	**Evaporation and evaporation measuring devices**	Explanation and display of pictures and Lecture	**Examination**

		and structure of plants			
9	**2+3**	**The student will be familiar with humidity and the decrease in the degree of saturation**	**Soil, devices for measuring soil characteristics, salinity, degree of reaction, soil components and particle sizes**	Explanation and display of pictures and Lecture	**Examination**
10	**2+3**	**The student will learn about the effect of humidity on plants**	**Natural plant environments in the world and Iraq, alpine environments, steppes, savannas, grasses, and tundra.**	Explanation and display of pictures and Lecture	**Examination**
11	**2+3**	**The student will learn about winds, their types, and their harm and benefits to plants**	**Desert cover in the world and Iraq**	Explanation and display of pictures and Lecture	**Examination**
12	**2+3**	**The student gets to know the most important contemporary environmental issues**	**The aquatic ecosystem on Earth, aquatic and halophytic plants**	Explanation and display of pictures and Lecture	**Examination**
13	**2+3**	**The student will be familiar with pollution and its interrelated effects**	**Forest vegetation in the world and Iraq – climate charts and their vocabulary, and a field experiment**	Explanation and display of pictures and Lecture	**Examination**
14	**2+3**	**The student will be familiar with the phenomenon of inverted gradient and global warming**	**A visit to a weather station**	Explanation and display of pictures and Lecture	**Examination**
15	**2+3**	**The student gets to know desertification, its types and causes**	**the exam**		

11. Course Evaluation

Daily and monthly tests

Participate by asking questions that are models of scientific discussions related to the academic subject

Submissions activities through new work and scientific reports

Course Description Form

1. Course Name:

Principles of Agricultural Extension

2. Course Code:

AGEX216

3. Semester / Year:

First semester/second year

4. Description Preparation Date:

28/03/2024

5. Available Attendance Forms:

Mandatory

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

(2) Hours, Number of units (2)

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

Name: Prof. Dr. khattab Abdullah Mohammed **Email:** khattab1981@uokirkuk.edu.iq

8. Course Objectives

The course aims to raise the level of students' knowledge about agricultural extension and how to solve problems facing farmers and deliver modern agricultural techniques to implement them on their farms by employing rural leaders in extension work.

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Definition of agricultural extension	knowledge	lecture	Daily and monthly exam, attendance and reports
2	2	The importance of agricultural extension	knowledge	lecture	Daily and monthly exam, attendance and reports
3	2	The interconnection between extension, education and agricultural research	knowledge	lecture	Daily and monthly exam, attendance and reports
4	2	Agricultural extension philosophy	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	2	Principles of agricultural extension	knowledge	lecture	Daily and monthly exam, attendance and reports
6	2	Agricultural extension training	Knowledge, skill and	lecture	Daily and monthly exam, attendance and reports

			attitude		
7	2	Extensional management	knowledge	lecture	Daily and monthly exam, attendance and reports
8	2	Leadership in agricultural extension	knowledge	lecture	Daily and monthly exam, attendance and reports
9	2	Rural leadership	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
10	2	Extensional communication	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	2	The process of diffusion and adoption of innovations	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	2	The decision-making process related to innovations	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	2	Methods and means of agricultural extension	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	2	Planning agricultural extension programs	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	2	Electronic agricultural extension	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Principles of agricultural extension, written b Dr. Abdullah Al-Samarrai
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:

Computer Applications/3

2. Course Code:

COAP217

3. Semester / Year:

first semester/ second year

4. Description Preparation Date:

28/03/2024

5. Available Attendance Forms:

Mandatory

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

(3) Hours, Number of units (1)

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

Name:Assist Prof. Basira Abdullah Ahmed **Email:** baseraabdullah@uokirkuk.edu.iq

8. Course Objectives

Developing the student's abilities to master making tables and writing mathematical equations via the computer

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Run Microsoft Word - open a new document - save the working page - make a backup copy - close a file - open a stored file	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	3	Inverting the language between Latin and Arabic - preparing an Arabic and Latin paragraph - preview before printing - printing the worksheet - specifying	Knowledge	lecture	Daily and monthly exam, attendance and reports

		the text - font and size - underlining - changing letter case			
3	3	Moving and copying information - Word clipboard - Search and replace - Numbers and bullets - Spell checker - Undo - Reverse undo - Page setup - Page margins - Text alignment - Line spacing	Knowledge	lecture	Daily and monthly exam, attendance and reports
4	3	Inserting a table - Inserting rows and columns - Selecting the row/column - Selecting the table - Adding borders and deleting cells - Shading the frame	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	3	Merge and split cells - Split the table - Change the height and width of cells - Auto fit - Repeat the table title - Header and footer - Sorting text	knowledge	lecture	Daily and monthly exam, attendance and reports
6	3	Page numbering - writing code - toolbar - drawing - deleting drawing shapes - filling - drawing line color - inserting, editing, deleting and moving the image	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	3	Microsoft Excel: Run it - Excel worksheet - Enter data - Save the file - Print the worksheet - Exit the program	knowledge	lecture	Daily and monthly exam, attendance and reports
8	3	Practical exam	knowledge	lecture	Daily and monthly exam, attendance and reports
9	3	Selecting cells - types of data - using mathematical	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

		formulas to select data - relative and absolute addresses - formulas that produce error values - moving cells - copying data Move or copy a worksheet and replace - move to a cell - delete cells - erase/insert a row or column			
10	3	Organizing the address list - Copying images and texts - Splitting web pages - Printing web pages - Search engines - How to search for information on the network - Using the search button in the toolbar -	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	3	Modify the height of a row or column - show and hide the row or column	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	3	Rename the worksheet - font type, size and style	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	3	Shape numbers - align data - add borders	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	3	Fill cells - sort data - create a chart	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	3	Edit Created Layout - Header/Footer Insert and remove a page break	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation	
The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Computer basics and office applications (Part second) / Ziad Muhammad Aboudi, Ghassan Hamid Abdel Majeed, Mustafa Diaa Al-Hass
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including
Electronic References, Websites	International journals .

Course Description Form

35. Course Name:	
English language2	
36. Course Code:	
ENLA218	
37. Semester / Year:	
1st semester / Second year	
38. Description Preparation Date:	
31/3/2024	
39. Available Attendance Forms:	
Classroom attendant	
40. Number of Credit Hours (Total) / Number of Units (Total)	
1	
41. Course administrator's name (mention all, if more than one name)	
Name: Susan Ibrahim Hassan **Email: susanih@uokirkuk.edu.iq**	
42. Course Objectives	
Course Objectives	**Introducing students to a wide range of important and practical vocabulary in ma situations, which will help them expand their vocabulary and improve their ability communicate in English. Additionally, it offers a thorough explanation of fundamer language rules such tenses, sentence forms, and grammatical structures, help students to comprehend sentence construction and proper language usage. Along v offering a variety of engaging texts at varying degrees of difficulty, this aids in development of students' comprehension of spoken and written English.**
43. Teaching and Learning Strategies	
Strategy	• **incorporating all four language skills—speaking, listening, reading, and writing—i instructional activities and lessons.** • **Teach vocabulary and grammar with real-world examples and settings.** • **Continuous evaluations and fast feedback are needed to track and direct students development.** • **assisting students in developing the abilities of self-learning, goal-setting, and self-evaluation** • **utilizing websites, multimedia, and language applications as examples of mod learning technology.**

44. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Learning these language structures helps learners prepare for real communication in various every day and professional situations.	Verb to be (am, is, are) Passive adjective	Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.	Students reading and answering questions. Quiz and HomeWorks
2	1		Verb to be Questions, Negatives and short answers Possessive (s)	Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.	Students reading and answering questions. Quiz and HomeWorks
3	1	makes it easy for Students to construct simple sentences, which aids in the accurate and unmistakable expression of fundamental facts and information with (1 He, she, it)	present simple 1 He, she, it questions, and negatives	Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.	Students reading and answering questions. Quiz and HomeWorks
4	1	To familiarize students with the difference in using the plural subject in the simple present tense	Present simple 2 I you, we they	Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.	Students reading and answering questions. Quiz and HomeWorks
5	1	Providing students with these terms and expressions helps them communicate more effectively and self-assuredly in the English language while also enhancing their speaking, listening, reading, and writing	There is/ there are How many? Prepositions of place Some and any This, that, this, those	Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.	Students reading and answering questions. Quiz and HomeWorks

		abilities.			
6	**1**	**Aid in the exact and varied expression of a broad range of ideas and thoughts, modal auxiliary verbs enrich the English language.**	**Can can't Was were Could Was born**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
7	**1**		**Exam**		
8	**1**	**Help to describe past experiences and events i using the simple past tense. Teaching roles for adding (ed) and kinds of irregular verbs.**	**Past simple1 Regular verbs Regular verbs Time expressions**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
9	**1**	**It enables students to comprehend the negative uses of the simple past tense. The ability to distinguish between countable and uncountable exists in the pupil. Discover the distinction between asking for something and making an offer.**	**Past simple 2 Negatives and ago, Time expressions Count and count nouns, Do you like? would you like?**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
10	**1**	**Improve ability to accurately express quantities. Gain skill in using comparative and superlative adjectives. Improve ability to take possession of things and to express it.**	**a and some Much and Many Comparative and superlative Have got**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
11	**1**	**help students learn how to use the present continuous tense to describe events being carried out at the present time.**	**Present continuous Who is it? Possessive pronoun**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
12	**1**	**By using the infinitive, students can express**	**Going to Infinitive of purpose**	**Giving students the chance to**	**Students reading and**

		about goals and objectives. Develop questioning to communicate more effectively.	**Questions forms Adverbs and adjective**	**communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**answering questions. Quiz and HomeWorks**
13	**1**	**Students may express just finished events that are related to the present by studying this tense.**	**Present perfect Ever, and never**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
14	**1**	**Make student Know difference between Yet and Just And the difference between Present, perfect and past simple**	**Yet and just Present, perfect and past simple**	**Giving students the chance to communicate and engage. Utilizing data shows. Play audio files or show video clips to help with pronunciation.**	**Students reading and answering questions. Quiz and HomeWorks**
15	**1**		**Exam**		

45. Course Evaluation

Daily Exam, Participation and Attendance (5%) + Monthly Exam (35%) + Final Exam (60%)

46. Learning and Teaching Resources

Required textbooks (curricular books, if ar	New Headway Plus Elementary by Liz And John Soars
Main references (sources)	English File series by Clive Oxenden and Christi Latham-Koenig
Recommended books and references (scientific journals, reports...)	"English Grammar in Use" by Raymond Murphy
Electronic References, Websites	TED Talks (https://www.ted.com) BBC News (https://www.bbc.com/news)

Course Description Form

1. Course Name:	
crimes of the Baath regime in Iraq	
2. Course Code:	
CRBA219	
3. Semester / Year:	
First semester / second year	
4. Description Preparation Date:	
31\3\2024	
5. Available Attendance Forms:	
Mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours / 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Batool Ibrahim Abdulrahman Email: batoolibrahim@uokirkuk.edu.iq	
8. Course Objectives	
Course Objectives	**The course aims to introduce the student to the crimes committed by the Baath regime and the punishments. The decisions issued against the perpetrators of crimes, the types of international crimes and their impact on the citizen. . And mass graves.**
9. Teaching and Learning Strategies	
Strategy	To make the learner able to know the types of international crimes and their impact on the people from a psychological, social and religious perspective and the punishments issued against the perpetrators of such crimes, as well as to know the oppression, abuse, murder and intimidation committed by the previous regime against Iraqi society.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Learn about the concept of crimes and their categories	Crimes of the Baath regime according to the Iraqi Supreme Criminal Court Law in 2005	Lecture and discussio	Oral examinatio and essay
2	2	Identify the types of international crimes	Crimes of the Baath regime according to the Iraqi Supreme Criminal Court Law in 2005	=	=
3	2	Learn about the decisions issued by Supreme Criminal Court	Crimes of the Baath regime according to the Iraqi Supreme Criminal Court Law in 2005	=	=
4	2	Identify the mechanisms of psychological crimes.	Psychological and social crimes and their effects	=	=
5	2	Identify the effects of psychological crimes	Psychological and social crimes and their effects	=	=
6	2	Identify social crimes	Psychological and social crimes and their effects	=	=
7	2	Identify violations of Iraqi laws. And learning about places of prisons detention of the Baath regime.	Psychological and social crimes and their effects		
8	2	exam			
٩	2	Identifying military and radioactive contamination and mine explosions	Environmental crimes of Baath regime in Iraq	=	=
10	2	Recognizing the destruction of cities and villages (scorched earth policy)	Environmental crimes of Baath regime in Iraq	=	=
11	2	Learn about draining marshes razing palm groves, trees and crops	Environmental crimes of Baath regime in Iraq	=	=
12	2	exam			
13	2	Identifying mass Graves	Mass grave crimes	=	=

14	2	Identification of genocide graves related to the Iran-Iraq War of 1980-1988 AD	Mass grave crimes	=	=
15	2	Identifying the genocidal graves of victims of the 1991 Shaabaniya uprising	Mass grave crimes	=	=

11. Course Evaluation

The semester endeavor is (40%) distributed (10) grades for daily preparation and participation, (30) monthly exams, with two monthly exams for each exam (15) grades, and the final exam grade is (60%).

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The crimes of the Baath regime in Iraq
Main references (sources)	International responsibility for committing the crime of genocide - The geography of the marshes and swamps in southern Iraq – Environmental crimes of the Baath regime in Iraq - Mass graves , a people under the soil
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Soil, water and plant analysis

2. Course Code:

SOPL221

3. Semester / Year:

Second semester /second year

4. Description Preparation Date:

31/3/2024

5. Available Attendance Forms:

Is mandatory

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

(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, numb of units (٢)

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

Name: Sameerah Faydhllah MOHAMED
Email: soil_70@uokirkuk.edu.iq

8. Course Objectives

Course Objectives	• The student knows how to take soil, water and plant models • The student is introduced to basic analysis methods • Review some basic concepts in the field of quantitative analysis • Introducing the student to methods of mechanical analysis of elements • The use of X-rays in the field of mineral and quantitative analysis • The use of radioactive and stable isotopes in the field of quantitative analysis of elements

9. Teaching and Learning Strategies

Strategy	• Brainstorming • Thinking strategy according to the student's ability, for example (if the student is able to learn analysis methods, he will acquire skill in linking knowledge of the soil's chemical and physical properties and fertility. • Critical Thinking strategy in learning, which is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to reach the desired solution.3- Conduct daily and monthly examinations and prepare practical reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Introduction to soil, water and plant analysis. s	Taking soil samples and preparing them for examination analysi	Explanation and display of pictures and Lecture	**Examination**

2	2+3	Obtaining samples,	taking plant samples and testing water samples	Explanation and display of pictures and Lecture	**Examination**
3	2+3	Reviewing some basic concepts in the field of quantitative analysis,	calculating and preparing standard solutions for the exam	Explanation and display of pictures and Lecture	**Examination**
4	2+3	Processing the results and verifying the accuracy of the analyses	. Preparing extracts and measuring the pH and EC test	Explanation and display of pictures and Lecture	**Examination**
5	2+3	Gravimetric analysis methods	, estimation of exchange images and exchange capacity of positive ions, CEC exam	Explanation and display of pictures and Lecture	**Examination**
6	**Examination**	Volumetric analysis methods	for estimating the level of organic carbon.	Explanation and display of pictures and Lecture	**Examination**
7	2+3	Electrolysis methods	for determining ready-made nitrogen and ready-made potassium, explanation and display of pictures	Explanation and display of pictures and Lecture	**Examination**
8	2+3	Electrolysis methods	such as ready-made nitrogen and potassium	Explanation and display of pictures and Lecture	**Examination**
9	2+3	Analysis methods based on spectrometry	estimation of ready-made phosphorus	Explanation and display of pictures and Lecture	**Examination**
10	2+3	Analysis methods based on atomic absorption spectrometry.	Estimation of the total soil content of elements	Explanation and display of pictures and Lecture	**Examination**
11	2+3	Analysis methods based on atomic emission spectrometry.	Mineral analysis using an X-Ray device	Explanation and display of pictures and Lecture	**Examination**
12	2+3	The use of X-rays in the field of mineral analysis and quantitative	determination of the redox potential of soil	Explanation and display of pictures and Lecture	**Examination**
13	2+3	**The use of radioactive and stable isotopes in the field of quantitative analysis of elements,**	**digesting plant samples and determining their element content**	Explanation and display of pictures and Lecture	**Examination**
14	2+3	The use of radioactive and stable isotopes in the field of quantitative analysis of elements,	digesting plant samples and determining their element content	Explanation and display of pictures and Lecture	**Examination**
15		**Examination**	**Examination**	**Examination**	**Examination**

11. Course Evaluation

Daily and monthly tests

Participate by asking questions that are models of scientific discussions related to the academic subject Submissions activities through new work and scientific reports	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	طرائق تحليل التربة و النبات و المياه و الأسمدة ، دكتور محمد منهل - الزعبي ، الدكتور أنس المصطفى الحصني و الدكتور حسان درغام
Main references (sources)	1- G.D. Christian, 1980. Analyti chemistry. John Wiley & Sons. Inc. 2- N.T. Faithfull, 2002. Methods Agricultural chemical analyisi. A practi HandBook. CABI publishing. 3- Soil Survey Laboratory method manu 2004. Soil survey Investigation report. No. version 4.0, USDA.
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern **عصام بشورو د. انطوان الصايغ، ٢٠٠٧. طرق تحليل تربة المناطق - الجافة وشبه الجافة. الجامعة الامريكية، بيروت.**
Electronic References, Websites	Iraqi academic journals, Research gate, US

Course Description Form

1. Course Name:

Principles of Plant Protection

2. Course Code:

PRPL222

3. Semester / Year:

Second semester/second year

4. Description Preparation Date:

29/03/2024

5. Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name:MOHAMMED ALBAYATI E-mail albayatiiu@uokirkuk.edu.iq

8. Course Objectives

The course aims to familiarize itself with the science of plant protection and the most important methods of combating it

9. Teaching and Learning Strategies

Verbal communication with students and motivation for teamwork in the learning process and use of communication skills...

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Introduction to the science	Introduction to the science of prevention of plants from insects	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
2	5	Insect feeding methods	Insect feeding methods and factors that helped its survival	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
3	5	reproductive methods	Insect reproductive methods	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
4	5	resistance	Insects	Lecture,	Verbal, editorial,

			resistance	presentations and interactive discussion	daily and monthly tests and scientific reports
5	5	Economic and important	Economic and important factors in Iraq	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
6	5	ferrets	Ferrets damage	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
7	5	First Examination		Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
8	5	Pests	Economic importance for Pests	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
9	5	Definitions terms	Definitions of phytosanitary terms	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
10	5	Pathogens of parasitic	Pathogens of parasitic plants	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
11	5	Non-parasitic pathogens	Non-parasitic pathogens	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
12	5	Methods of spreading	Methods of spreading plant diseases	Lecture, presentations and interactive	Verbal, editorial, daily and monthly tests and scientific reports

				discussion	
13	5	Methods of resistance	Methods of resistance plant diseases	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
14	5	biological control	biological control	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports
15	5	Final Examination	Final Examination	Lecture, presentations and interactive discussion	Verbal, editorial, daily and monthly tests and scientific reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Plant Disease Plant Entomology
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:	
Farm machinery and equipment	
2. Course Code:	
FAMA223	
3. Semester / Year:	
second semester /second year	
4. Description Preparation Date:	
31/3/2024	
5. Available Attendance Forms:	
Is mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (٢)	
7. Course administrator's name (mention all, if more than one name)	
Name: MA-NIHAYAT HUSSEIN AMEEN Email: mnas_int@uokirkuk.edu.iq	
8. Course Objectives	
Course Objectives	Introducing, qualifying and training students theoretically and practically: 1- Introducing a student to general concepts and definitions in agricultural machinery and equipment and motivating him with deductive skills 2- Introducing the student to arithmetic problems 3- Identify the problem or obstacle and know how to find the appropriate solution
9. Teaching and Learning Strategies	
Strategy	1- Identifying the components and parts of agricultural machines, identifying the engine parts, devices and systems associated with them, and how to create productivity and energy and shifting towards more mechanical harvesting technology for these machines, as well as managing, exploiting and using machines and machines in the agricultural field in a scientific and technical correct manner. 2- Presenting questions about the topic to demonstrate students' understanding through their answers 3- Conduct daily and monthly examinations and prepare practical reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Lectures + exercises and practical observations	A historical overview of the science of machinery and agricultural machinery + viewing the types of tractors and a general understanding of its components and general specifications.	Lectures + teaching–learning aids	Daily questions + tests
2	2+3	Lectures + exercises and practical observations	Basics of agricultural machinery and equipment classification + identifying and viewing engine parts and how they work (operation and maintenance)	Lectures + teaching–learning aids	Daily questions + tests
3	2+3	Lectures + exercises and practical observations	Parts of the engine and the functions of its parts and learning about the types of combustion engines (examples of types of engines) + learning about the parts of devices and systems and their maintenance	Lectures + teaching–learning aids	Daily questions + tests
4	2+3	Lectures + exercises and practical observations	Two– and four–stroke spark and diesel engines course + showing films about strokes and strokes and practical observations	Lectures + teaching–learning aids	Daily questions + tests
5	2+3	Lectures + exercises and practical observations	Power transmission devices + mathematical applications	Lectures + teaching–learning aids	Daily questions + tests
6	Examination	Examination	Examination	Examination	Examination
7	2+3	Lectures + exercises and practical observations	Lubrication and cooling systems in engines + watching timing devices, how they operate and maintain them View and maintain air and water cooling devices Watch the lubrication devices, types of filters, and how to install and clean them	Lectures + teaching–learning aids	Daily questions + tests
8	2+3	Lectures + exercises and practical	Practice driving a tug and attaching machinery to the tug	Lectures + teaching–learning aids	Daily questions + tests

		observations			
9	2+3	Lectures + exercises and practical observations	Fuel devices: diesel and gasoline / spark ignition devices + view fuel devices: gasoline and diesel view spark ignition devices	Lectures + teaching-learning aids	Daily questions + tests
10	2+3	Lectures + exercises and practical observations	ransmission devices: clutch - gearbox - differential And the methods used when transferring and converting movement in agricultural machinery and equipment + viewing the transmission devices Watch the hydraulic devices, the power take-off shaft, and how to connect the equipment to the hydraulic device in the tug	Lectures + teaching-learning aids	Daily questions + tests
11	2+3	Lectures + exercises and practical observations	Hydraulic devices and power take-off shaft + see the types of plows and learn about them and how they operate and maintain them See the types of softeners and learn about them and how they work	Lectures + teaching-learning aids	Daily questions + tests
12	2+3	Lectures + exercises and practical observations	Soil tillage equipment Soil softening equipment + viewing the types of seeds and how they work	Lectures + teaching-learning aids	Daily questions + tests
13	2+3	Lectures + exercises and practical observations	Leveling equipment Grain seeding and agricultural equipment + view types of animal and chemical fertilizer spreaders	Lectures + teaching-learning aids	Daily questions + tests
14	2+3	A field visit to the fields	Chemical and animal manure spreading equipment (Spraying and fogging equipment) + conducting a study on industrial safety (use of machines and equipment)	Lectures + teaching-learning aids	Daily questions + tests
15		Examination	Examination	Examination	Examination

11. Course Evaluation

Daily and monthly tests

Participate by asking questions that are models of scientific discussions related to the academic subject

Submissions activities through new work and scientific reports

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	. Agricultural machines and machines - 628th edition, Yassin Hashim Al-Tahan, Muhammad Jassim Nimah, 2nd edition, revised and expand - Mosul / University of Mosul
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and mode
Electronic References, Websites	Iraqi academic journals, Research g US

Course Description Form

1. Course Name:

Vegetables production

2. Course Code:

VEPR224

3. Semester / Year:

Second Semester / second year

4. Description Preparation Date:

02/04/2024

5. Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name: ALI ASGHAR ZAINEL AZHEEN OTHMAN MOHAMMED
Email:aliznl@uokirkuk.edu.iq

8. Course Objectives

The curriculum includes studying the winter and summer vegetables crops,the original habitats of vegetable crops, the climate suitable for their growth, services,the date and methods of planting vegetables crops, identifying the varieties of each crop, of each and the botanical description each crop.

9. Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projectserbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Knowledge and skills	Introduction and definition of vegetable crops	lecture	Daily and monthly exam, attendance and reports
2	5	Knowledge and skills	Clasification of vegetables crops	lecture	Daily and monthly exam, attendance and reports
3	5	Knowledge	Facilities and	Lecture and	Daily and monthly

		and skills	tools necessary for growing vegetables	field	exam, attendance and reports
4	5	Knowledge and skills	Multiplication of vegetables crops	Lecture and field	Daily and monthly exam, attendance and reports
5	5	Knowledge and skills	Methods of irrigation vegetables crops	Lecture and field	Daily and monthly exam, attendance and reports
6	5	Knowledge and skills	Methods of fertilization vegetables crops	Lecture and field	Daily and monthly exam, attendance and reports
7	5	Knowledge and skills	Services vegetables crops	Lecture and field	Daily and monthly exam, attendance and reports
8	5	Knowledge and skills	Study solanaceae family as tomato and potato	Lecture and fields	Daily and monthly exam, attendance and reports
9	5	Knowledge and skills	Study solanaceae family as pepper and eggplant	Lecture and field	Daily and monthly exam, attendance and reports
10	5	Knowledge and skills	Study cucurbitacea as cucmber and squash	Lecture and field	Daily and monthly exam, attendance and reports
11	5	Knowledge and skills	Study cucurbitacea as melon and watermelon	Lecture and field	Daily and monthly exam, attendance and reports
12	5	Knowledge and skills	Study brassicaceae family as cabbage and califlower	Lecture and field	Daily and monthly exam, attendance and reports
13	5	Knowledge and skills	Study fabacae family as pea nad broad beans	Lecture and field	Daily and monthly exam, attendance and reports
14	5	Knowledge and skills	Study bulbous family as onion and garlic	Lecture +Field	Daily and monthly exam, attendance and reports
15	5	Knowledge and skills	Exan	Exam	
11.Course Evaluation					
The grade for the semester endeavor is (40%), divided into (5) grades for daily preparation, participation, and submitting reports, (15) grade for the practical semester					

exams, and (20) for the theoretical semester exams, and the final exam grade is from (60%), and the final practical exam is (20) The final theoretical exam is (40) marks	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if an	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Vegetables production. Adnan Naser. 1989
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:

Plant physiology

2. Course Code:

PLPH225

3. Semester / Year:

First semester

4. Description Preparation Date:

31/03/2024

5. Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name: Name: Mohammed Abdul Aziz Lateef email: mahammdazyz@uokirkuk.edu.iq

8. Course Objectives

Introduce the student to the aspects or factors that plant physiology focuses on by studying the physiological processes that take place within the plant.

9. Teaching and Learning Strategies

Introduce the student to how to plan in the cultivation of the field according to environmental data and the student's ability to understand the impact of environmental conditions and their impact on physiological processes in plants.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Definition of plant physiology. Basic Rules of plant physiology	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	5	Solution and colloidal systems	Knowledge	lecture	Daily and monthly exam, attendance and reports
3	5	Water Relationships	Knowledge	lecture	Daily and monthly exam, attendance and reports
4	5	Absorption and Translocation of water and Minerals	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	5	Photosynthesis	Knowledge	lecture	Daily and monthly exam, attendance and reports
6	5	Photosynthesis	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	5	Respiration	Knowledge	lecture	Daily and monthly exam, attendance and reports
8	5	Metabolism	Knowledge	lecture	Daily and monthly exam, attendance and reports
9	5	Biological of Nitrogen Fixation	Knowledge,	lecture	Daily and monthly exam,

			skill		attendance and reports
10	5	Plant Nutrition	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
11	5	Growth and Developments	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
12	5	Plant hormones and plant growth regulators	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
13	5	Plant physiology under stress	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
14	5	Kinds of stress, effect of stress and stress tolerance mechanisms	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports
15	5	General Review and Exam	Knowledge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Field Crop Physiology, authored by Prof. Ahmed Abu Al-Naga Qandil and Prof. Ali Saeed Muhammad Sharif, 2012 Plant Physiology Hasan Jundiai 2003
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals

Course Description Form

1. Course Name:
Land leveling
2. Course Code:
LALE226
3. Semester / Year:
Second semester/second year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Professor Dr. Hussain Thahir Tahir Email: hussain.tahir@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**1- The student is introduced to the basics of grading the land and preparing i for agricultural and construction purposes, as well as introducing him to the relationship of settlement to irrigation systems, methods of reclamation, and establishing flat projects.** **2- Prepare the student to develop an integrated plan for land grading and be able to identify the machines and machines needed for leveling and complete within practical and scientific timelines to ensure the preservation of the soil's physical and chemical properties.**

9. Teaching and Learning Strategies

Strategy	1- The student must have the ability to manage settlement projects according to the available capabilities. 2- The student must have the ability to make the measurements required to calculate the productivity of machines used at work. 3- To implement the knowledge and skills he learned in his practical life.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Show topic data word and Data Show	Introduction, historical overview, related sciences, importance in agricultural affairs, goals of settlement and land modification.	Calculator + Lectures	Daily questions + tests
2	2+3	Show topic data word and Data Show	Types of settlement, criteria for choosing the type, application requirements.	Calculator + Lectures	Daily questions + tests
3	2+3	Show topic data word and Data Show	Things and factors that must be followed before starting leveling and adjustment work, soil factors, environmental and plant factors, human factors, exploitation factors, outputs from leveling and adjustment. .	Calculator + Lectures	Daily questions + tests
4	2+3	Show topic data word and Data Show	Topographic variation: its relationship to settlement and adjustment, estimation methods, direct methods, indirect methods, preparing maps, interpreting maps within adjustment criteria and linking them to the purposes and objectives of agricultural exploitation.	Calculator + Lectures	Daily questions + tests
5	2+3	Show topic data word and Data Show	Land modification without slope: importance, methods of use, purposes.	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Field works, implementation methods, work stages, calculations and estimates, evaluation and evaluation.	Calculator + Lectures	Daily questions + tests
7	2+3	Show topic data word and Data Show	Land modification with one slope: importance, methods of use, purposes, field work, implementation methods, work stages.	Calculator + Lectures	Daily questions + tests
8	2+3	Show topic data word and Data Show	Accounts and estimates, evaluation and evaluation.	Calculator + Lectures	Daily questions + tests
9	2+3	Show topic data word and Data Show	Land modification with two slopes: importance, methods of use, purposes, field works,	Calculator + Lectures	Daily questions + tests

			methods of implementation,		
10	**2+3**	Show topic data word and Data Show	stages of work.	Calculator + Lectures	Daily questions + tests
11	**2+3**	Show topic data word and Data Show	Accounts and estimates, evaluation and evaluation.	Calculator + Lectures	Daily questions + tests
12	**2+3**	Show topic data word and Data Show	Selection of machines and machinery: types of machines, selection criteria, operational efficiency of machines, optimal choice curve.	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	Laser leveling and adjustment strategies.	Calculator + Lectures	Daily questions + tests
14	**2+3**	Show topic data word and Data Show	Making a settlement and modification plan, topographic factors, human factors, water resources	Calculator + Lectures	Daily questions + tests
15	**2+3**	Show topic data word and Data Show	Nature and types of machines and machines, modification times (summer, winter). Ways to success.	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Levelig area. Written by Fereydoun. faculty of Agriculture. University of Baghdad, 1987 2- Machines and equipment for soil reclamation and leveling, Dr. Najeeb Abdel Halim Hindawi / Agricultural Engineering, Makki Majeed Abboud Al-Shakarji / Agricultural Engineering, 1981
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, USGS

Course Description Form

1. Course Name:
Freedom and Democracy
2. Course Code:
FRDE227
3. Semester / Year:
second semester/ second year
4. Description Preparation Date:
28/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(1) Hours, Number of units (1)
7. Course administrator's name (mention all, if more than one name)
Name:Assist Prof. Basira Abdullah Ahmed **Email:** baseraabdullah@uokirkuk.edu.iq
8. Course Objectives
Know the importance of studying freedom and democracy.
9. Teaching and Learning Strategies
Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	The concept of freedom, the concept of anarchy, the concept of democracy, the historical	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	1	Forms of the system: indirect	Knowledge	lecture	Daily and monthly exam, attendance and reports
3	1	Civil,society,	Knowledge	lecture	Daily and monthly exam, attendance and reports
4	1	The concept of freedom	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	1	The concept of anarchism	knowledge	lecture	Daily and monthly exam, attendance and reports
6	1	The basic conditions of a	Knowled	lecture	Daily and monthly exam,

		democratic system and its characteristics	ge, skill and attitude		attendance and reports
7	1	Features of the democratic system	knowled ge	lecture	Daily and monthly exam, attendance and reports
8	1	development of the concept of democracy in the Mesopotamian civilization	knowled ge	lecture	Daily and monthly exam, attendance and reports
9	1	The pillars of democracy, the basic conditions of the democratic system	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports
10	1	Features of the democratic system, types democracy	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports
11	1	democracy, democracy, concept, and manifestations	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports
12	1	Different systems of electio	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports
13	1	Democracy applications	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports
14	1	democratic values and functions	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports
15	1	The report on human rights in Islam comprehended and surpassed all hypothetical	Knowled ge, skill	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Human Rights and Democracy / Dr. Ghassan Karim Majhab, Amjad Zein Al-Abidin Tohm
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including
Electronic References, Websites	International journals .

Course Description Form

1. Course Name:
Computer Applications/4
2. Course Code:
COAP228
3. Semester / Year:
second semester/ second year
4. Description Preparation Date:
28/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(3) Hours, Number of units (1)
7. Course administrator's name (mention all, if more than one name)
Name:Assist Prof. Basira Abdullah Ahmed **Email:** baseraabdullah@uokirkuk.edu.iq
8. Course Objectives
Introducing the student to the components of the computer, explaining the units of information input and graduation, and providing and developing the student's abilities by using the main applications in the computer
9. Teaching and Learning Strategies
Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Identifying the computer and its parts, turning the computer on/off	Knowledge	lecture	Daily and monthly exam, attendance and reports
2	3	Computer parts, input/output units, memory, central processing unit	Knowledge	lecture	Daily and monthly exam, attendance and reports
3	3	Central Processing Unit (C.P.U), main functions, motherboard (M/B) and	Knowledge	lecture	Daily and monthly exam, attendance and reports

		how to communicate with computer parts			
4	3	Input units (mouse/keyboard), output units (Monitor), memory (RAM, ROM)	Knowledge, skills and attitudes	lecture	Daily and monthly exam, attendance and reports
5	3	Secondary memory, hard disk parts, how to store information on the disk, information about the disk	knowledge	lecture	Daily and monthly exam, attendance and reports
6	3	Introduction to the operating system (Windows), application software	Knowledge, skill and attitude	lecture	Daily and monthly exam, attendance and reports
7	3	Practical exam (1)	knowledge	lecture	Daily and monthly exam, attendance and reports
8	3	Windows - use the mouse, minimize/maximize windows - close windows, close windows, exit windows	knowledge	lecture	Daily and monthly exam, attendance and reports
9	3	Moving windows from one place to another, controlling window size (width/height), taskbar - date, time	knowledge	lecture	Daily and monthly exam, attendance and reports
10	3	Organizing the address list - Copying images and texts - Splitting web pages - Printing web pages - Search engines - How to search for information on the network - Using the search button in the toolbar -	knowledge	lecture	Daily and monthly exam, attendance and reports
11	3	MY COMPUTER Desktop, Create a shortcut icon for an application or file,	knowledge	lecture	Daily and monthly exam, attendance and reports

		Recycle Bin - Window Explorer, Format floppy disks			
12	3	Install files - select/choose folder, create folder - rename, delete file/folder, copy file/folder, move file/folder	knowledge	lecture	Daily and monthly exam, attendance and reports
13	3	Screen settings - screen saver, change mouse cursor - double transfer speed control	knowledge	lecture	Daily and monthly exam, attendance and reports
14	3	Software Installation and Uninstallation, Disk Information, Help Request) HELP	knowledge	lecture	Daily and monthly exam, attendance and reports
15	3	Practical exam (1)	knowledge	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Computer basics and office applications (Part forth) / Ziad Muhammad Aboudi, Ghassan Hamid Abdel Majeed, Mustafa Diaa Al-Hass
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including
Electronic References, Websites	International journals .

Course Description Form

1. Course Name:
Soil Physics
2. Course Code:
SOPH311
3. Semester / Year:
First semester/third year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Wael Fahmi Abdulrahman Email: waelfahmi@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**Enabling the student to understand and comprehend the subject of soil physics and how to take soil models and analyze them in the laboratory**

9. Teaching and Learning Strategies

Strategy	1- Explanation of topics at length while conducting laboratory experiments 2- Presenting questions about the topic to demonstrate students' understanding through their answers 3- Conduct daily examinations and prepare practical reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Show topic data word and Data Show	1-Soil as three phase 2- Mathematical relation ships of soil component	Calculator + Lectures	Daily questions + tests
2	2+3	Show topic data word and Data Show	1-Soil texture 2- Example of mathematical	Calculator + Lectures	Daily questions + tests
3	2+3	Show topic data word and Data Show	1-Stoke s law 2- Determination of soil texture	Calculator + Lectures	Daily questions + tests
4	2+3	Show topic data word and Data Show	1-Limitation of Stoke s law 2- Hydraulic conductivity method	Calculator + Lectures	Daily questions + tests
5	2+3	Show topic data word and Data Show	1-Soil structure 2-Pipette method	Calculator + Lectures	Daily questions + tests
6	Seme ster exam	Show topic data word and Data Show	1-Specific surface area 2- soil moisture determination	Calculator + Lectures	Daily questions + tests
7	2+3	Show topic data word and Data Show	1-Potential of water 2- Soil moisture curve	Calculator + Lectures	Daily questions + tests
8	2+3	Show topic data word and Data Show	Examination	Calculator + Lectures	Daily questions + tests
9	2+3	Show topic data word and Data Show	1-Types of water potential 2-Bulk densitz	Calculator + Lectures	Daily questions + tests
10	2+3	Show topic data word and Data Show	1-Darcy s law 2- Determination of structure	Calculator + Lectures	Daily questions + tests
11	2+3	Show topic data word and Data Show	1-Shear strength 2- Mean weight diameter	Calculator + Lectures	Daily questions + tests
12	2+3	Show topic data word and Data Show	1-Soil aeration 2-Soil consistency	Calculator + Lectures	Daily questions + tests
13	Seme ster exam	Show topic data word and Data Show	Examination	Calculator + Lectures	Daily questions + tests
14	2+3	Show topic data word and Data Show	1-Soil temperature 2-Upper and lower limit	Calculator + Lectures	Daily questions + tests
15	2+3	Show topic data word and Data Show	1-Soil radiation 2-Soil crust	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports

Student activities by creating posters and illustrations related to the academic subject	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Basics of soil physics. Written by Hillel, Daniel. Translated by Dr. Mahdi Ibrahim Odeh. 1990. 2- Fundamental of soil physics. D. Hillel. 1980. 3- Principles of Soil Physics. Lal ana Shukla. 2004. USA. 4- Environment of Soil Physics. D. Hillel. 2004. USA.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, USGS

Course Description Form

1. Course Name:
Soil Organic Matter
2. Course Code:
SOOR312
3. Semester / Year:
First Semester/third year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Hanan Salah Mahdee Email: Hanansalah@uokirkuk.edu.iq
8. Course Objectives

Course Objectives The main goal of this program is to teach students basic concepts related to organic matter in the soil an understand its role in various environmental syste including agricultural, forests, marshes, and swam The overall objectives of this study are to make student able to:	: Estimating the percentage of organic matte the soil using various laboratory methods Estimate it in the field and then express quantitatively in kilograms or tons per hectare.. Drawing a relative outcome of the organic carb balance between the soil and its external surroundings.....

9. Teaching and Learning Strategies	
Strategy	A- Cognitive objectives A1- The student gets to know the concept of organic matter in the soil A2- The student should classify the sources of organic matter in the soil A3- The student should distinguish between different types of organic aggregates according to the speed of their decomposition and their chemical, physical and natural properties. A4- To recognize the types of organic matter and their functions in the soil A5- To know the significance of the presence of each type of organic matter and its relationship to the functions of the soil A6- Linking the proportions and types of organic materials and soil management methods within the framework of sustainable development B - The skills objectives of the course. B1 - Enabling students to learn about methods for studying the types of organic matter in the soil B2 - Establishing technical and professional skills to the extent that qualifies the student to choose appropriate agricultural methods for managing

	organic matter in the soil

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Show topic data word and Data Show	Defining organic matter and determining its origin and nature in the soil	Calculator + Lectures	Daily questions + tests
2	2+3	Show topic data word and Data Show	Distinguish between types of soils according to their organic content and its relationship to climatic and environmental conditions	Calculator + Lectures	Daily questions + tests
3	2+3	Show topic data word and Data Show	The concept of soil environment, biological activity, and the food web in it	Calculator + Lectures	Daily questions + tests
4	2+3	Show topic data word and Data Show	Processes of transformation of organic matter in the soil, such as decomposition, mineralization, organic matter, etc	Calculator + Lectures	Daily questions + tests
5	2+3	Show topic data word and Data Show	Classification of organic matter in the soil according to the speed of its decomposition, the degree of its solubility, and the ratio of carbon to nitrogen in it	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Factors affecting the formation of humus in soil: soil environment, nature of the main components of organic matter and microbial mass	Calculator + Lectures	Daily questions + tests
7	2+3	Show topic data word and Data Show	Types of humus according to the type of vegetation cover, the degree of its solubility	Calculator + Lectures	Daily questions + tests

			with alkaline solvents, and its saturation with basic cations.		
8	**2+3**	Show topic data word and Data Show	Physical, chemical and physical properties of humic and humic acids	Calculator + Lectures	Daily questions + tests
9	**2+3**	Show topic data word and Data Show	The organic-mineral complex, the relationship of active groups, and the ratio of fulvic acid to humic acid in soil formation	Calculator + Lectures	Daily questions + tests
10	**2+3**	Show topic data word and Data Show	The nature of carbon categories and their implications for the agricultural and environmental value of the soil in terms of its fertility, release of nutrients, and resistance to pollution.	Calculator + Lectures	Daily questions + tests
11	**2+3**	Show topic data word and Data Show	How to preserve the organic stock in the soil and manage it sustainably	Calculator + Lectures	Daily questions + tests
12	**2+3**	Show topic data word and Data Show	The necessity of fertilizing with animal waste and compost to preserve agricultural soil	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	Explaining the effect of traditional agricultural methods on depleting the soil of its organic stock	Calculator + Lectures	Daily questions + tests
14	**2+3**	Show topic data word and Data Show	Understanding the sequential and interconnected effects of organic matter in improving soil characteristics and the impact of this on the overall components of the ecosystem	Calculator + Lectures	Daily questions + tests
15	**2+3**	Show topic data word and Data Show	Focusing on the role of organic matter in sustainable development: protecting lands from degradation,	Calculator + Lectures	Daily questions + tests

			desertification and pollution, in addition to reducing climate change.		

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil Organic Matter and Biological Activity - Springer link.springer.com/**book**/10.1007%2F978-94-009-5105-1 **Academic** edition. Corporate edition. Skip to: Main ... **Book**. Developments in Plant and **Soil**Sciences. Volume 16 1985 ... Pages 1-35. Introduction **Soil Organic Matter** — A Perspective on its Nature, Extraction, Turnover and Role in **Soil** Fertility.
Main references (sources)	. Soil Organic Matter in Sustainable Agriculture (Advances in Agroecology) by Fred Madoff and Ray R. Weil (May 27, 2004). CRC Press; 1 edition. 416 pages. 2. Soil Organic Matter Characterization. Chapter 3. Carbon Nitrogen in the Terrestrial Environment. Publisher Spri Netherlands 2008, pp 81-111
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient a modern
Electronic References, Websites	Soil Organic Matter - (Second Edition) - ScienceDirect www.sciencedirect.com/science/**book**/9780080114705 The online version of **Soil Organic Matter** by M. Kononova on ScienceDirect.com, the world's lea platform for high quality peer-reviewed full-text **boo**

Course Description Form

1. Course Name:
Soil Fertility
2. Course Code:
SOFE313
3. Semester / Year:
First Semester/third year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Hanan Salah Mahdee Email: : Hanansalah@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**Fertilizers and soil fertility is a science that seeks to identify the basic concepts of soil fertility and productivity, learn about the relationship between soil and plants, know the amount of nutrients in the soil, how much of them the plant needs, how to add them, and the methods and times of adding them to agricultural fields.**
9. Teaching and Learning Strategies	
Strategy	A- Cognitive objectives A1- The student gets to know the concept of soil fertility science A2- The student should classify the sources of fertilizers in nature A3- The student should separate between natural and chemical fertilizers A4- The student will analyze the amount of nutrients in the soil and protect the soil from pollution A5- The student should evaluate the cost of adding fertilizers and productivity B - The program's skill objectives B1 - Introducing the student to the concept of soil fertility science B2 - The student's ability to evaluate the addition of organic and biological fertilizers with traditional systems B3 - Enable students to analyze production costs

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**2+3**	Show topic data word and Data Show	Teach the student terminology related to soil fertility and productivity	Calculator + Lectures	Daily questions + tests
2	**2+3**	Show topic data word and Data Show	Studying the necessary elements, whether major or minor, and how to calculate chemical and organic fertilizers	Calculator + Lectures	Daily questions + tests
3	**2+3**	Show topic data word and Data Show	**The student will learn about methods of adding fertilizers and evaluating soil fertility**	Calculator + Lectures	Daily questions + tests
4	**2+3**	Show topic data word and Data Show	**The student gets to know the properties of chemical and natural fertilizers**	Calculator + Lectures	Daily questions + tests
5	**2+3**	Show topic data word and Data Show	**For the student to become familiar with chemical fertilizer calculations**	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	**For the student to learn about the relationship of soil and plant analyzes to various fertilization 7recommendations for plant growth**	Calculator + Lectures	Daily questions + tests
7	**2+3**	Show topic data word and Data Show	**The student will be familiar with the sources of fertilizers, classification of**	Calculator + Lectures	Daily questions + tests

			fertilizers, methods of adding fertilizer, and comparison between animal and chemical fertilizers		
8	**2+3**	Show topic data word and Data Show	**The student gets to know fertilizer needs and the fertilizer equation**	Calculator + Lectures	Daily questions + tests
9	**2+3**	Show topic data word and Data Show	**The student will be familiar with the evaluation of soil fertility**	Calculator + Lectures	Daily questions + tests
10	**2+3**	Show topic data word and Data Show	**The student will be familiar with methods of calculating organic fertilizers**	Calculator + Lectures	Daily questions + tests
11	**2+3**	Show topic data word and Data Show	**For the student to get to know**	Calculator + Lectures	Daily questions + tests
12	**2+3**	Show topic data word and Data Show	**The student will know how to calculate added organic fertilizers**	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	The student will be familiar with the methods of measuring elements 14in the soil	Calculator + Lectures	Daily questions + tests
14	**2+3**	Show topic data word and Data Show	**The student will be familiar with the types and methods of adding fertilizers and how to conduct agricultural experiments**	Calculator + Lectures	Daily questions + tests
15	Semester exam				

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Awad, Kazem Mashhout (1987) Fertilization and Soil Fertility, Ministry of Higher Education and Scientific Research, University of Basra. 2- Al-Naimi, Saadallah (1999) Fertilizers and soil fertility. Ministry of Higher Education and Scientific Research, University of Mosul.Baghdad. Translated. 3. Havlin, J.L., Tisdale, S.L., Nelson, W.L., and Beaton, J.D. 2005, Soil Fertility and Fertilizers, 5th edition. USA 4. Page, A.L. et. Al. 1982, Methods of soil analyisi, part 2 2nd Chemical and microbiological properties. Madison, Wisconsin, USA
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Soil Science Society Of America Library Genesis

Course Description Form

1. Course Name:	
Irrigation	
2. Course Code:	
IRRI314	
3. Semester / Year:	
First semester/Third year	
4. Description Preparation Date:	
31/3/2024	
5. Available Attendance Forms:	
Is mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Wael Fahmi Abdulrahman Email: waelfahmi@uokirkuk.edu.iq	
8. Course Objectives	
Course Objectives	**1- Studying different irrigation methods and systems** **2- Studying the optimal use and increasing the efficiency of water use**
9. Teaching and Learning Strategies	
Strategy	1- Enable the student to learn how to evaluate and characterize modern irrigation methods 2- Enabling the student to know how to use irrigation and draina networks for soil, and to obtain the best methods and exploit the for agriculture 3- Enabling the student to know how to conduct the modern irrigation method and link it with the puncture system to achieve integration between the irrigation and puncture process 4- Using modern methods and training students on them 5- Enabling students to use modern software and model irrigatio movement 6- Linking irrigation issues with the drainage system to achie integration

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**2+3**	Show topic data word and Data Show	The concept of irrigation, irrigation in ancient and modern times.	Calculator + Lectures	Daily questions + tests
2	**2+3**	Show topic data word and Data Show	Irrigation water sources, irrigation water quality.	Calculator + Lectures	Daily questions + tests
3	**2+3**	Show topic data word and Data Show	Soil physical properties associated with irrigation.	Calculator + Lectures	Daily questions + tests
4	**2+3**	Show topic data word and Data Show	The relationship of water with soil, soil moisture constants, movement of water in the soil, water changes.	Calculator + Lectures	Daily questions + tests
5	**2+3**	Show topic data word and Data Show	Water measurement	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Plant water consumption	Calculator + Lectures	Daily questions + tests
7	**2+3**	Show topic data word and Data Show	Water needs and irrigation scheduling.	Calculator + Lectures	Daily questions + tests
8	**2+3**	Show topic data word and Data Show	First month exam	Calculator + Lectures	Daily questions + tests
9	**2+3**	Show topic data word and Data Show	Transport and distribution of irrigation water, movement of water in pipes and open channels.	Calculator + Lectures	Daily questions + tests
10	**2+3**	Show topic data word and Data Show	Design of soil and lined irrigation channels.	Calculator + Lectures	Daily questions + tests
11	**2+3**	Show topic data word and Data Show	Adequacy, efficiency and consistency of irrigation.	Calculator + Lectures	Daily questions + tests
12	**2+3**	Show topic data	Traditional irrigation	Calculator	Daily

		word and Data Show	methods.	+ Lectures	questions + tests
13	Semester exam	Show topic data word and Data Show	Modern irrigation methods.	Calculator + Lectures	Daily questions + tests
14	**2+3**	Show topic data word and Data Show	Pumping water and how to calculate pump capacity.	Calculator + Lectures	Daily questions + tests
15	**2+3**	Show topic data word and Data Show	Second month exam	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	1- Irrigation, its basics and applications. Written by Dr. Nabil Ibrahim Al-Tayef and Issam Khudair Al-Hadithi. 1990. 2- Irrigation and drainage. Written by Dr. Laith Khalil Ismail. 2000.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, USGS

Course Description Form

1. Course Name:
Soil Chemistry
2. Course Code:
SOCH315
3. Semester / Year:
First semester/Third year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Hanan Salah Mahdee Email: : Hanansalah@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	Soil chemistry studies the chemical and physicochemical properties of soil (soil colloids, organic matter, and electrochemical properties)

9. Teaching and Learning Strategies	
Strategy	A- Cognitive objectives A1- The student gets to know the concept of soil chemistry A2- The student will be familiar with the structure of mineral and organic soil colloids A3- The student should understand the ionic exchange capacity and the factors affecting it A4- The student should distinguish between types of soil acidity A5- To learn about adsorption and the equations to describe it A6- To know the significance of the soil's ability to stabilize and retain some ions A7- Connecting the liquid phase and the solid phase of the soil B- The program's skill objectives B1 - Introducing the student to the concept of soil chemistry B2 - The student's ability to distinguish between positive adsorption and negative adsorption in soil B3 - Enable students to recognize the equations describing adsorption B4- That the student is able to identify methods for estimating ion exchange capacity

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Show topic data word and Data Show	The student will be familiar with the concept of soil chemistry and its relationship to soil characteristics.	Calculator + Lectures	Daily questions + tests
2	2+3	Show topic data word and Data Show	The student will be familiar with the structure of mineral and organic colloids	Calculator + Lectures	Daily questions + tests
3	2+3	Show topic data word and Data Show	The student gets to know the concept of adsorption	Calculator + Lectures	Daily questions + tests
4	2+3	Show topic data word and Data Show	The student will be familiar with the equations describing adsorption	Calculator + Lectures	Daily questions + tests
5	2+3	Show topic data word and Data Show	The student gets to know the ionic exchange capacity in soil and the equations to describe it	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	The student gets to know the factors determining ion exchange capacity	Calculator + Lectures	Daily questions + tests
7	2+3	Show topic data word and Data Show	The student will learn about negative and positive ion exchange and its importance in the soil	Calculator + Lectures	Daily questions + tests
8	2+3	Show topic data word and Data Show	The student gets to know the capacity and speed of displacement	Calculator + Lectures	Daily questions + tests
9	2+3	Show topic data word and Data Show	The student gets to know the concept of fixing elements	Calculator + Lectures	Daily questions + tests
10	2+3	Show topic data word and Data Show	The student gets to know the concept of holding elements	Calculator + Lectures	Daily questions + tests
11	2+3	Show topic data word and Data Show	The student gets to know the types of soil acidity	Calculator + Lectures	Daily questions + tests

12	2+3	Show topic data word and Data Show	The student gets to know the factors affecting soil acidity	Calculator + Lectures	Daily questions + tests
13	2+3	Show topic data word and Data Show	The student gets to know the concept of buffer capacity	Calculator + Lectures	Daily questions + tests
14	Semester exam	Show topic data word and Data Show	The student gets to know the components of the soil solution and their relationship to soil fertility	Calculator + Lectures	Daily questions + tests
15	2+3	Show topic data word and Data Show	The student will be familiar with calculating the coefficient of effectiveness and efficiency	Calculator + Lectures	Daily questions + tests

11.Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Ahmed Abdel Hadi Al-Rawi, Ahmed Haider Al-Zubaidi, and Nazima Saleh Qaddouri, 1986, Soil Chemistry - Minist of Higher Education and Scientific Research.
Main references (sources)	2- Kazem Mashhout Awad, 19 Principles of Soil Chemistry, - Ministry Higher Education and Scientific Researc
Recommended books and references (scientific journals, reports...)	Iraqi and foreign academic scientific journals
Electronic References, Websites	Soil Science Society Of America Library Genesis

Course Description Form

1. Course Name:
Soil and water pollution
2. Course Code:
SOWA316
3. Semester / Year:
first semester /Third year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, numb of units (٢)
7. Course administrator's name (mention all, if more than one name)
Name: Sameerah Faydhllah Mohamed Email: soil_70@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	• Presenting the idea of soil and water pollution to the student • The definition of pollution, including its origins and causes; the sorts of ecosystems; • Determine the elemental cycles and how they affect pollution in the environment. Next, determine the pollution of water, including that in surface and groundwater. • Recognize soil pollution, including biological soil pollution, pesticide-contaminated soi pollution, and pesticide biodegradation in the soil. • Recognize bacterial and viral water pollution, industrial water pollution, and the behav of pesticides in the aquatic environment.
9. Teaching and Learning Strategies	
Strategy	• Brainstorming • Thinking strategy based on the student's aptitude, such as (if the student can mas analytic techniques, he will gain expertise in connecting the chemical and phys characteristics of the soil with fertility). • The term "critical thinking strategy" in education refers to the highest stages thinking and entails posing an issue, analyzing it logically, and then coming up wit desired solution.3. Perform assessments on a daily and weekly basis and provide us

	reports.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2+3**	The ecology, as well as the definition, origins, and effects of pollution, are taught to the students.	Taking soil samples and preparing them for examination analysi	Soil and water pollution	**Examination**
2	**2+3**	The elements' cycles—nitrogen, phosphorus, oxygen, carbon, and sulfur—are taught to the pupil.	taking plant samples and testing water samples	Soil and water pollution	**Examination**
3	**2+3**	The learner will gain knowledge regarding pollution of ocean, groundwater, and surface waters.	calculating and preparing standard solutions for the exam	Soil and water pollution	**Examination**
4	**2+3**	The subject will study water contamination caused by bacteria, viruses, and worms.	. Preparing extracts and measuring the pH and EC test	Soil and water pollution	**Examination**
5	**2+3**	The learner will be conversant with battery, fertilizer, and industrial water pollution.	, estimation of exchange images and exchange capacity of positive ions, CEC exam	Soil and water pollution	**Examination**
6	**Examination**	The action of pesticides on living things as well as in aquatic environments is explained to the student.	for estimating the level of organic carbon.	Soil and water pollution	**Examination**
7	**2+3**	The learner will get knowledge about sewage waste, fertilization behavior in water pollution, and biological pollution.	for determining ready-made nitrogen and ready-made potassium, explanation and display of pictures	Soil and water pollution	**Examination**
8	**2+3**	The segmentation of water according to its suitability for various uses will be familiar to the student.	such as ready-made nitrogen and potassium	Soil and water pollution	**Examination**
9	**2+3**	The learner learns about biological contamination of soil.	estimation of ready-made phosphorus	Soil and water pollution	**Examination**
10	**2+3**	The learner will gain knowledge on pesticide contamination of soil, including how pesticides behave in various soil types and how they decompose naturally.	Estimation of the total soil content of elements	Soil and water pollution	**Examination**
11	**2+3**		Mineral analysis using an X-Ray device	Soil and water pollution	**Examination**
12	**2+3**	The learner will gain knowledge about how pesticides are controlled	determination of the redox potential of soil	Soil and water pollution	**Examination**

		chemically and naturally in the soil, as well as how plants absorb pesticides.			
13	**2+3**	The student will gain knowledge about radioactive contamination, thermal pollution, ozone layer depletion, and global warming.	**digesting plant samples and determining their element content**	Soil and water pollution	**Examination**
14	**2+3**		digesting plant samples and determining their element content	Soil and water pollution	**Examination**
15	**2+3**	**Examination**	**Examination**	**Examination**	**Examination**

11. Course Evaluation

Daily and monthly tests

Participate by asking questions that are models of scientific discussions related to the academic subject

Submissions activities through new work and scientific reports

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	١ التلوث البيئي .أ.د.فليح حسن –أ.م.د.بهاء عبد الجبار
Main references (sources)	**1- G.D. Christian, 1980. Analytical chemistry. John Wiley & Sons. Inc.** **2- N.T. Faithfull, 2002. Methods in Agricultural chemical analyisi. A practical HandBook. CABI publishing.** **3- Soil Survey Laboratory method manual, 2004. Soil survey Investigation report. No. 42, version 4.0, USDA.** ٤- التلوث البيئي .د.محمد عمار الراوي.١٩٨٨
Recommended books and references (scientific journals, reports…)	١- المجلات العلمية الاكاديمية العراقية
Electronic References, Websites	Iraqi academic journals, Research gate, US

Course Description Form

1. Course Name:

Analysis and Experimental Design

2. Course Code:

EXDE317

3. Semester / Year:

First semester/Third year

4. Description Preparation Date:

31/3/2024

5. Available Attendance Forms:

Is mandatory

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

(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)

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

Name: Dr.Zakarya Mahmod Mohamed
Email: zakamahmod@uokirkuk.edu.iq

8. Course Objectives

Course Objectives	**1- Teaching students about the types of agricultural experiments** **2- How to design, analyze and interpret single-factor agricultural experiments** **3-How to compare transaction averages** **4-How to design, analyze and interpret two-factor agricultural experiments** **5-Learn about the concept of correlation and regression and how to calculate and interpret them**

9. Teaching and Learning Strategies

Strategy	B1- Providing the student with the skills of applying scientific methods regarding the management of agricultural fields. B2 - Training the student to design and plan experiments according to the designs. B3 - Providing the student with the necessary skills for laboratory tests and how to give appropriate scientific judgments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2+3**	A general review in statistics Statistical tests	Statistics exercises Discussion of statistical tests	Calculator + Lectures	Daily questions + tests

2	**2+3**	Completely Randomized Design (CRD)	Statistics exercises Discussion of statistical tests	Calculator + Lectures	Daily questions + tests
3	**2+3**	Dunnett's Test Least Significant Difference Test (LSD) - Duncan's Test	s Discussion of statistical tests	Calculator + Lectures	Daily questions + tests
4	**2+3**	Randomized Complete Block Design (RCBD)	Exercises in CRD	Calculator + Lectures	Daily questions + tests
5	**2+3**	Randomized Complete Block Design (RCBD)	Exercises on how to test averages in CRD	Calculator + Lectures	Daily questions + tests
6	Semester exam			Calculator + Lectures	Daily questions + tests
7	**2+3**	Latin Square Design (LSD)	Exercises in RCBD	Calculator + Lectures	Daily questions + tests
8	**2+3**	Factorial Experiments	Exercises in RCBD	Calculator + Lectures	Daily questions + tests
9	**2+3**	Split-Plots Design	Exercises in LSD	Calculator + Lectures	Daily questions + tests
10	**2+3**	Split-block (or strip-plot) design	Exercises in Factorial Experiments (RCBD)	Calculator + Lectures	Daily questions + tests
11	**2+3**	Regression Analysis	Exercises in Split-Plots Design	Calculator + Lectures	Daily questions + tests
12	**2+3**	Regression Analysis	Exercises in LSD strip-plot design	Calculator + Lectures	Daily questions + tests
13	Semester exam			Calculator + Lectures	Daily questions + tests
14	**2+3**	Factorial Experiments	Exercises in Factorial Experiments	Calculator + Lectures	Daily questions + tests
15	**2+3**	Factorial Experiments	Exercises in Regression	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Design and analysis of agricultural experiments. The narrator is humbled and Abdul Aziz is behind Hilal. Mosul University Press, 1981, Applications in the Design and Analysis of Experiments, Medhat Al-Sahuki and Karima Muhammad Wahib, Dar Al-Hekma for Printing and Publishing, 1991.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, USGS

Course Description Form

1. Course Name:

Remote sensing

2. Course Code:

RESE321

3. Semester / Year:

Second Semester / Third Year

4. Description Preparation Date:

1/4/2024

5. Available Attendance Forms:

Mandatory

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

(5) hours (2) hours for the theoretical part and (3) hours for the practical part, the number of units (3)

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

Name: Prof. Dr. Dalshad Rasool Azeez
Email: dr_dalshad@uokirkuk.edu.iq
Assist. Lecturer.Noorjan Essmat Noori
essmat.noorjan@uokirkuk.edu.iq

8. Course Objectives

Course Objectives

Teaching the student the importance of satellite visuals in soil science studies and helping him to know the science of remote sensitization and its importance and what can be used from it with modern technological development in the fields of agriculture, soil and water.

9. Teaching and Learning Strategies

Strategy	The use of remote sensing technology and its applications in the fields of soil and water science, the student's knowledge of the basic concepts of remote sensing science - Knowledge of the types of satellites and sensors - How to analyze, interpret and deal with visuals - How to use applications for remote sensing in various fields

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Cognitive	What is remote sensing (remote sensing)?	Lecture	Daily and monthly exam, attendance and reports
2	5	Cognitive	Electromagnetic radiation, electromagnetic field	Lecture	Daily and monthly exam, attendance and reports
3	5	Cognitive	Interaction with the atmosphere, interaction with targets	Lecture	Daily and monthly exam, attendance and reports
4	5	Cognitive	Positive and negative sensing	Lecture	Daily and monthly exam, attendance and reports
5	5	Cognitive	Visualization properties	Lecture	Daily and monthly exam, attendance and reports
6	5	Cognitive	Sensing from the ground, from the air and from space	Lecture	Daily and monthly exam, attendance and reports
7	5	Cognitive	Characteristics of satellites	Lecture	Daily and monthly exam, attendance and reports
8	5	Cognitive	Spatial resolution, cell size, scale, spectral clarity	Lecture	Daily and monthly exam, attendance and reports
9	5	Cognitive	Radimetric resolution, temporary/temporal resolution	Lecture	Daily and monthly exam, attendance and reports
10	5	Cognitive	Cameras & Aerial Photography	Lecture	Daily and monthly exam, attendance and reports
11	5	Cognitive	Multispectral scanning, thermal imaging	Lecture	Daily and monthly exam, attendance and reports
12	5	Cognitive	Geometric distortion in visuals	Lecture	Daily and monthly exam,

					attendance and reports
13	5	Cognitive	Elements of visual interpretation	Lecture	Daily and monthly exam, attendance and reports
14	5	Cognitive	Digital visual processing, visual enhancement	Lecture	Daily and monthly exam, attendance and reports
15	5	Cognitive	Classification and analysis of visualizations	Lecture	Daily and monthly exam, attendance and reports

11. Course Evaluation

The degree of quarterly pursuit of (40%) distributed (5) degrees for daily preparation, participation and reporting, and (25) degrees of theoretical monthly exams by two monthly exams, and (10) degrees of practical monthly exams by two monthly exams and the final exam score of (60%) distributed (40) degrees for the theoretical part and (20) degrees for the practical part.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relev books and references.
Main references (sources)	1- Book of Foundations and Applications of Remote Sensing, 2015, authored by Dr. Juma Muhammad Dawood 2- 2- GIS book Practical applications in geographical analysis using Arc GIS DesktopK, authored by Dr. Omar Abdullah Ismail Al-Qassab.
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International magazines within Scopus containers

Course Description Form

1. Course Name:
Soil Salinity
2. Course Code:
SOSA322
3. Semester / Year:
Second semester/third year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Wael Fahmi Abdulrahman Email: waelfahmi@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**1 – Identify the problem of salinity and the nature of its treatment or methods of living with it** **2– Identify the ionic composition of salts** **3– Identifying the salt phases of soils affected by salinity** **4– How to address this problem or methods of living with it**
9. Teaching and Learning Strategies	
Strategy	1- Enabling students to learn how to evaluate and characterize soils affected by salinity 2- Enabling students to know how to use these soils and exploit them for agriculture 3- Enabling students to know how to conduct the appropriate reclamation method

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Show topic data word and Data Show	The problem of salinity and its impact on agricultural production	Calculator + Lectures	Daily questions + tests
2	2+3	Show topic data word and Data Show	Sources of salt components	Calculator + Lectures	Daily questions + tests
3	2+3	Show topic data word and Data Show	Sources of salt components Soil formation conditions affected by salts.	Calculator + Lectures	Daily questions + tests
4	2+3	Show topic data word and Data Show	Water and salt balance in the soil and its relationship to salinity.	Calculator + Lectures	Daily questions + tests
5	2+3	Show topic data word and Data Show	Chemical and physical properties of salts accumulated in salt-affected soils	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Stages of salinization in soil.	Calculator + Lectures	Daily questions + tests
7	2+3	Show topic data word and Data Show	Classification and naming of soils affected by salts.	Calculator + Lectures	Daily questions + tests
8	2+3	Show topic data word and Data Show	The effect of soil salinity on plant growth + salt tolerance of agricultural crop	Calculator + Lectures	Daily questions + tests
9	2+3	Show topic data word and Data Show	First month exam.	Calculator + Lectures	Daily questions + tests
10	2+3	Show topic data word and Data Show	Irrigation water quality.	Calculator + Lectures	Daily questions + tests
11	2+3	Show topic data word and Data Show	Controlling soil salinity and ways to live with it.	Calculator + Lectures	Daily questions + tests
12	2+3	Show topic data word and Data Show	Reclamation of saline soils.	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	Management of reclaimed soils.	Calculator + Lectures	Daily questions + tests
14	2+3	Show topic data word and Data Show	Results of some saline land reclamation experiments in Iraq.	Calculator + Lectures	Daily questions + tests
15	2+3	Show topic data word and Data Show	Second month exam	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricu	1- Soil salinity - A. Dr.. Ahmed Haider Al-Zubaidi

books, if any)	(1989). Ministry of Higher Education and Scientific Research - University of Baghdad. 2- Land reclamation-A. Dr.. Ahmed Haider Al-Zubai (1992). Ministry of Higher Education and Scientific Research - University of Baghdad.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, USGS

Course Description Form

1. Course Name:

Soil Morphology

2. Course Code:

SOMO323

3. Semester / Year:

Second Semester / Third Year

4. Description Preparation Date:

1/4/2024

5. Available Attendance Forms:

Mandatory

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

(5) hours (2) hours for the theoretical part and (3) hours for the practical part, the number of units (3)

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

Name: Prof. Dr. Dalshad Rasool Azeez
Email: dr_dalshad@uokirkuk.edu.iq
Assist. Lecturer.Noorjan Essmat Noori
essmat.noorjan@uokirkuk.edu.iq

8. Course Objectives

Course Objectives

Enable the student to characterize the soil in the field through morphological qualities that can be visually distinguished.

9. Teaching and Learning Strategies

Strategy	The emergence and development of the soil, the factors and processes of soil formation, the study of morphological soil characteristics, the possibility of recording morphological characteristics in real time without referring to the laboratory (in the field) such as: texture, construction, color, texture, ... etc., and the student can diagnose the morphological properties in the field, characterize them and how to document them in the morphological description form.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Cognitive	The concept of soil morphology	Lecture	Daily and monthly exam, attendance and reports
2	5	Cognitive	Soil formation and development	Lecture	Daily and monthly exam, attendance and reports
3	5	Cognitive	Some concepts of soil morphology	Lecture	Daily and monthly exam, attendance and reports

4	5	Cognitive	Weathering as a morphological factor, physical weathering	Lecture	Daily and monthly exam, attendance and reports
5	5	Cognitive	Chemical weathering	Lecture	Daily and monthly exam, attendance and reports
6	5	Cognitive	Soil formation / washing, removal,	Lecture	Daily and monthly exam, attendance and reports
7	5	Cognitive	Soil formation/calcification process, salinization	Lecture	Daily and monthly exam, attendance and reports
8	5	Cognitive	Soil Formation/Lateritalism, Podzolic/Gleying Reduction, Clay Collection Process	Lecture	Daily and monthly exam, attendance and reports
9	5	Cognitive	Soil composition factors: climate	Lecture	Daily and monthly exam, attendance and reports
10	5	Cognitive	Soil composition factors: material of origin	Lecture	Daily and monthly exam, attendance and reports
11	5	Cognitive	Soil composition factors: topography, biofactor, time	Lecture	Daily and monthly exam, attendance and reports
12	5	Cognitive	Main soil horizons	Lecture	Daily and monthly exam, attendance and reports
13	5	Cognitive	Secondary soil horizons	Lecture	Daily and monthly exam, attendance and reports
14	5	Cognitive	Soil Micromorphology - Characterization - Uses and Applications	Lecture	Daily and monthly exam, attendance and reports
15	5	Cognitive	Morphology and composition of Iraqi soils	Lecture	Daily and monthly exam, attendance and reports

11. Course Evaluation

The degree of quarterly pursuit of (40%) distributed (5) degrees for daily preparation, participation and reporting, and (25) degrees of theoretical monthly exams by two monthly exams, and (10) degrees of practical monthly exams by two monthly exams and the final exam score of (60%) distributed (40) degrees for the theoretical part and (20) degrees for the practical part.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Dr. Walid Khaled Al-Akidi and Dr. Shaker Mahmoud Al-Issawi 1989. Soil morphology. Dr. Falah Abu Nuqta and Dr. Hassan Suleiman Habib, Soil Survey and Classification.
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International magazines within Scopus containers

Course Description Form

1. Course Name:
Drainage
2. Course Code:
DRAI324
3. Semester / Year:
Second semester/third year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, numb of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Professor Wael Fahmi Abdulrahman Email: waelfahmi@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**1- Preparing students who have the ability to use modern puncture methods and describe these methods accurately with the possibility of using them within Iraqi soil and integrating these methods with irrigation networks and getting rid of excess water.** **2- Entering the agricultural sector with distinguished efficiency through participation. In puncture projects, modern irrigation technologies, and the use of the best methods in order to reduce water use within agricultural lands, reduce the risk of salt and desertification, and remove excess water.**

9. Teaching and Learning Strategies

Strategy	1- Enabling the student to learn how to evaluate and characterize modern puncture methods 2- - Enabling the student to know how to use digging nets for soil and to obtain the best methods and exploit them for agriculture 3- Enabling the student to know how to conduct the modern irrigation method and link it with the puncture system to achieve integration between the irrigation and puncture process 4- Using modern methods and training students on them

	5- Enabling students to use modern software and model the movement of water towards the sewers 6- Linking irrigation issues with the drainage system to achieve integration

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Show topic data word and Data Show	The concept of puncture, justifications for establishing punctures, the relationship of puncture to plant growth and productivity.	Calculator + Lectures	Daily questions + tests
2	2+3	Show topic data word and Data Show	Physical soil properties related to drilling.	Calculator + Lectures	Daily questions + tests
3	2+3	Show topic data word and Data Show	The hydrological cycle and the location of irrigation and drainage.	Calculator + Lectures	Daily questions + tests
4	2+3	Show topic data word and Data Show	Water flow in the soil, its forms, and its relationship to the concept of drainage, flow analysis	Calculator + Lectures	Daily questions + tests
5	2+3	Show topic data word and Data Show	Puncture and soil salinity, washing requirements and salt balance.	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Investigations required to establish trocars, exploratory and design investigations.	Calculator + Lectures	Daily questions + tests
7	2+3	Show topic data word and Data Show	Measurement of saturated water conductivity above and below the groundwater level.	Calculator + Lectures	Daily questions + tests
8	2+3	Show topic data word and Data Show	Types of trocars, their classification, and the objectives of their construction.	Calculator + Lectures	Daily questions + tests
9	2+3	Show topic data word and Data Show	First month exam.	Calculator + Lectures	Daily questions + tests
10	2+3	Show topic data word and Data Show	Open trocars + covered trocars.	Calculator + Lectures	Daily questions + tests
11	2+3	Show topic data word and Data Show	Incisive and vertical trocars.	Calculator + Lectures	Daily questions + tests
12	2+3	Show topic data word and Data Show	Designs of open and covered puncture systems and calculation of distances between trocars.	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	Mechanization of trocars and supplies for implementing trocars.	Calculator + Lectures	Daily questions + tests
14	2+3	Show topic data word and Data Show	Maintenance of open and covered trocars.	Calculator + Lectures	Daily questions + tests
15	2+3	Show topic data word and Data Show	Second month test	Calculator + Lectures	Daily questions + tests

11. Course Evaluation	
Daily and monthly tests through questions presented to them on the subject studied Degrees are awarded for student participation in scientific research and reports Student activities by creating posters and illustrations related to the academic subject	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Inspection, investigations, designs, implementation and maintenance. Writte by Dr. Mohsen Muhareb Al-Lami and Dr. Alaa Saleh Al-Janabi. 1991.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient a modern
Electronic References, Websites	Iraqi academic journals, Resear gate, USGS

1. Course Name:
Soil minerals
2. Course Code:
SOMI325
3. Semester / Year:
Second semester/third year
4. Description Preparation Date:
31/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) Hours, Number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Assist .Prof. Dr. dhahir khaleel Ali **Email:** dhahirgeo@uokirkuk.edu.iq
8. Course Objectives
The course aims to raise the level of students' knowledge about the soil minerals and its identification and the mineralogical and physical properties.
9. Teaching and Learning Strategies
Oral discussion about the soil minerals subject and argue question and auditory with visual clearness supporting by real examples.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Introduction to soil minerals and its importance ,soil sources	knowledge	Lecture+practice	Daily and monthly exam, attendance and reports
2	5	The weathering and minerals	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
3	5	Soil minerals , light and heavy minerals	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
4	5	Silicate minerals and structure	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
5	5	Neasosilicate and sorosilicate minerals	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
6	5	Cyclosilicate and Inosilicate minerals	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
7	5	Phylosilicate and	knowledge	lecture+practice	Daily and monthly

		Tectosilicate minerals			exam, attendance and reports
8	5	Clay minerals and its structure, 1:1 minerals	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
9	5	1:2 clay minerals and its properties	Knowledge,	lecture+practice	Daily and monthly exam, attendance and reports
10	5	2:2clay minerals and its properties	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
11	5	Principle of clay minerals classification	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
12	5	Clay minerals formation sources	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
13	5	Mechanism of clay minerals from silicates	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
14	5	The clay minerals negative charge sources	Knowledge,	lecture+practice	Daily and monthly exam, attendance and reports
15	5	Polysubstitution in clay minerals	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (5) grades for classroom activity, (20)grade for semi semester test,(15)grade for practice test, the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	.
Main references (sources)	Soil minerals .Eissa ,S.K ,Baghdad university p
Recommended books and references (scientific journals, reports...)	Iraqi and international academic scientific journals
Electronic References, Websites	International journals included in Scopus

1. Course Name:

Economics of natural resources

2. Course Code:

ECNA326

3. Semester / Year:

Second semester/third year

4. Description Preparation Date:

31/03/2024

5. Available Attendance Forms:

Mandatory

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

(3) Hours, Number of units (3)

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

Name: Assist .Prof. Dr. dhahir khaleel Ali **Email:** dhahirgeo@uokirkuk.edu.iq

8. Course Objectives

The course aims to raise the level of students' knowledge about the importance and classification of natural resources and water supply with demands and that affected factors.

9. Teaching and Learning Strategies

Oral discussion about the natural resources economics subject and argue question and auditory clearness supporting by real examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Concept importance and classification of natural resources	knowledge	Lecture	Daily and monthly exam, attendance and reports
2	3	Economic and water resources relations	knowledge	lecture	Daily and monthly exam, attendance and reports
3	3	The obstacles in water resources	knowledge	lecture	Daily and monthly exam, attendance and reports
4	3	Water resources supply economics	Knowledge	lecture	Daily and monthly exam, attendance and reports
5	3	The roles of technology in water resources supply	knowledge	lecture	Daily and monthly exam, attendance and reports
6	3	Water demands and the affected factors	Knowledge	lecture	Daily and monthly exam, attendance and reports
7	3	Water resources uses and demands	knowledge	lecture	Daily and monthly exam, attendance and reports
8		The form of water resources demands	knowledge	lecture	Daily and monthly exam, attendance and reports
9	3	The earth and its properties	Knowledge,	lecture	Daily and monthly exam, attendance and reports
10	3	The dies different earth uses	Knowledge	lecture	Daily and monthly exam, attendance and reports

11	3	The models and samples urban area structure	Knowledge	lecture	Daily and monthly exam, attendance and reports
12	3	Berjs centric sectors sample of urban area	Knowledge	lecture	Daily and monthly exam, attendance and reports
13	3	Homer hot sectors of city plans	Knowledge	lecture	Daily and monthly exam, attendance and reports
14	3	Britain city plans of city	Knowledge	lecture	Daily and monthly exam, attendance and reports
15	3	The correlation between different samples of the cities	Knowledge	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for classroom activity, (30)grade for semi semester test, the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	.
Main references (sources)	The natural resources economics .Al-samaray,H. A 199 the natural resources economics
Recommended books and references (scientific journals, reports...)	Iraqi and international academic scientific journals
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:
English language /3
2. Course Code:
ENLA327
3. Semester / Year:
Second semester/ third year
4. Description Preparation Date:
31/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hour
7. Course administrator's name (mention all, if more than one name)
Name: Berevan Qader Omar **Email:** beree.omer@gmail.com
8. Course Objectives
Teaching this curriculum aims to make the student familiar with the English language as it is a global language from which the student will benefit widely in his academic life. This curriculum is an extension of what the student learned in the first and second stages.
9. Teaching and Learning Strategies
It is a semi-integrated curriculum for the pre-intermediate level, which includes the necessary basics for learning the English language for the pre-intermediate level, along with exercises. It includes interrogative articles and four types of verb tenses, with an explanation of each tense in the form of the affirmative, negative, and question. It also includes how to Expressing quantities, articles, and indefinite in the English language, comparative and superlative adjectives, and identifying verb forms in the English language.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Question words	Knowledge	lecture	Exercise
2	1	Present simple for pre- intermediate level	Knowledge	lecture	Exercise

3	1	Present continuous for pre- intermediate level	Knowledge	lecture	Exercise
4	1	Past simple for pre-intermediate level	Knowledge	lecture	Exercise
5	1	Past continuous for pre- intermediate level	Knowledge	lecture	Exercise
6	1	Expression of quantity	Knowledge	lecture	Quiz
7	1	Articles	Knowledge	lecture	Exercise
8	1	Comparative and superlative	Knowledge	lecture	Exercise
9	1	Have to	Knowledge	lecture	Exercise
10	1	Introduction to modal auxiliary verbs	Knowledge	lecture	quiz
11	1	Should	Knowledge	lecture	quiz
12	1	Must	Knowledge	lecture	Exercise
13	1	Verb pattern 1	Knowledge	lecture	Exercise
14	1	Verb pattern 2	Knowledge	lecture	Exercise
15	1	Irregular verbs	Knowledge	lecture	Quiz

11.Course Evaluation

Semester endeavor (40 marks): 15 marks for the first month exam + 5 marks for quiz
15 marks for second month exam + 5 marks for quiz
Final exam (60 marks)

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	New headway plus (elementary student bo / written by : John and Liz Soars / Oxf university press
Main references (sources)	Cambridge press
Recommended books and references (scientific journals, reports...)	My English library website
Electronic References, Websites	You tube and some useful websites

Course Description Form

1. Course Name:
Soil Survey And Classification
2. Course Code:
SOSU411
3. Semester / Year:
First Semester / Fourth Year
4. Description Preparation Date:
1/4/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours (2) hours for the theoretical part and (3) hours for the practical part, the number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Dalshad Rasool Azeez Email: dr_dalshad@uokirkuk.edu.iq Assist. Lecturer.Noorjan Essmat Noori essmat.noorjan@uokirkuk.edu.iq
8. Course Objectives
Course Objectives The student's understanding of the concept of survey, its importance, pillars, grades, how to implement it, understanding the methods and foundations of soil taxonomy, and studying the philosophical systems of soil classification and the method of its formation in some countries, especially in the United States of America
9. Teaching and Learning Strategies

Strategy	Study the types of soils spread in the world through the forms of surveys followed and the approved classification systems obtained from laboratory analyzes and field studies, Enable the student, after receiving the course, to distinguish the types of soils and prepare their maps

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Cognitive	Definition of soil survey, types of soil maps	Lecture	Daily and monthly exam, attendance and reports
2	5	Cognitive	Types of soil survey	Lecture	Daily and monthly exam, attendance and reports
3	5	Cognitive	Orders of the soil survey	Lecture	Daily and monthly exam, attendance and reports
4	5	Cognitive	General introduction to taxonomy, evolution of soil taxonomy, evolution of soil taxonomy in the United States, genetic system	Lecture	Daily and monthly exam, attendance and reports
5	5	Cognitive	Definition of soil classification, importance of soil classification, rules	Lecture	Daily and monthly exam, attendance and reports
6	5	Cognitive	(Soil taxonomy) orders,: Histosols entisols, , inceptisols	Lecture	Daily and monthly exam, attendance and reports
7	5	Cognitive	(Soil taxonomy system) Spodosols،Alfisols، vertisols	Lecture	Daily and monthly exam, attendance and reports
8	5	Cognitive	(Soil taxonomy system) Ultisols ، Oxisols Gelisols	Lecture	Daily and monthly exam, attendance and reports
9	5	Cognitive	(Soil taxonomy system) Mollisois, Aridisols,Andisols	Lecture	Daily and monthly exam, attendance and reports
10	5	Cognitive	(Soil taxonomy system) sub order	Lecture	Daily and monthly exam, attendance and reports
11	5	Cognitive	great group	Lecture	Daily and monthly exam,

					attendance and reports
12	5	Cognitive	sub group	Lecture	Daily and monthly exam, attendance and reports
13	5	Cognitive	family	Lecture	Daily and monthly exam, attendance and reports
14	5	Cognitive	About the World Soil Classification (WRB)	Lecture	Daily and monthly exam, attendance and reports
15	5	Cognitive	General review of the types of soils spread in the world	Lecture	Daily and monthly exam, attendance and reports

11. Course Evaluation

The degree of quarterly pursuit of (40%) distributed (5) degrees for daily preparation, participation and reporting, and (25) degrees of theoretical monthly exams by two monthly exams, and (10) degrees of practical monthly exams by two monthly exams and the final exam score of (60%) distributed (40) degrees for the theoretical part and (20) degrees for the practical part.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relev books and references.
Main references (sources)	Al-Akaidi, Walid Khaled. (1986). Soil Survey and Classification Pedology. Directorate of Dar Al-Kutub for Printing and Publishing, University of Mosul, Iraq. Al-Mashhadani, Ahmed Saleh Muhaimeed. (1994). Soil Survey and Classification. . Directorate of Dar Al-Kutub for Printing and Publishing, University of Mosul, Iraq.
Recommended books and references (scientific journals, reports…)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International magazines within Scopus containers

Course Description Form

1. Course Name:
Soil & Water Conservation
2. Course Code:
SOCO412
3. Semester / Year:
First semester/Forth year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Wael Fahmi Abdulrahman Email: waelfahmi@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	
9. Teaching and Learning Strategies	
Strategy	1- Preparing qualified agricultural cadres to use scientific programs that contribute to improving the quality and quantity of production Agricultural Production . 2- Follow up on the performance of graduates in the field of work and the extent to which graduates' specifications match the market need and extent Implementing and applying what has been studied in the field of work.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		Show topic data word and Data Show	Introduction	Calculator + Lectures	Daily questions + tests
2		Show topic data word and Data Show	Precipitation + soil and water conservation EXP	Calculator + Lectures	Daily questions + tests
3		Show topic data word and Data Show	Run _ Off +Rainfall data analysis	Calculator + Lectures	Daily questions + tests
4		Show topic data word and Data Show	Run _ Off + Rational Method	Calculator + Lectures	Daily questions + tests
5		Show topic data word and Data Show	Type of water erosion + Curve Number Method	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Semester exam	Calculator + Lectures	Daily questions + tests
7		Show topic data word and Data Show	Water erosion mechanics	Calculator + Lectures	Daily questions + tests
8		Show topic data word and Data Show	Erosion and soil productivity	Calculator + Lectures	Daily questions + tests
9		Show topic data word and Data Show	Water erosion control + USLE	Calculator + Lectures	Daily questions + tests
10		Show topic data word and Data Show	Wind erosion mechanics	Calculator + Lectures	Daily questions + tests
11		Show topic data word and Data Show	Wind erosion mechanics + Slide 12and Film show	Calculator + Lectures	Daily questions + tests
12		Show topic data word and Data Show	Wind erosion control	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	Semester exam	Calculator + Lectures	Daily questions + tests
14		Show topic data word and Data Show	Erosion and pollution	Calculator + Lectures	Daily questions + tests
15		Show topic data word and Data Show	Economic and social application of soil conservation	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books any)	1- Al-Tayef, Nabil Ibrahim 1991. Soil and water conservation. Ministry of Higher Education and Scientific Research, Univers of Baghdad 2- Ismail, Laith Khalil, 1985. Soil Conservation. Ministry of Higher Education and Scientific Research. University of Mosul Nineveh. translator. 3- Al-Ani, Abdel Fattah Abdullah, 1987. Soil Conservation. Ministry of Higher Education and Scientific Research. Technic Institutes Foundation. Baghdad. 4- Fahd, Ali Abd. 1984. Soil and Water Conservation Engineering. Ministry of Higher Education and Scientific Research. University of Baghdad. Baghdad. Translated.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient and modern
Electronic References, Websites	Iraqi academic journals, Research gate, USGS

Course Description Form

47.Course Name:

Soil Microbiology

48.Course Code:

SOMI413

49.Semester / Year:

/first semester/Fourth year

50.Description Preparation Date:

03/04/2024

51.Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name: Dr. kawther hkeem ibraheim **Email:** microbiology_1975@uokirkuk.edu.iq

54.Course Objectives

The course aims to raise the level of students' knowledge about the soil microbiology projects and how to distinguish between them practically and culturing with acknowledging how characterization laboratory.doil microbiology id the study of microorganism in soil their functions and how they effects soil properties

55.Teaching and Learning Strategies

Verbal communication with students, urging them to work together in the learning process, using written communication skills to increase comprehension, as well as the brainstorming method to attract students' attention, activate the thinking strategy according to the student's ability, and conduct scientific visits to agricultural projects.

56. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	- Introduction to soil microbiology - Know general aspect of soil microbiology Know the important scientists contributed in development of microbiology	Introduction and the historical development of soil microbiology	Lecture& practicall y using lab	Daily and monthly exam, attendance and reports- Making quizzes - Discussion
2	5	- How to classifying soil layers with its characterizations each type	The classification of soil layers with chemical ,physical and biological characters	lecture&p ractically using lab	Daily and monthly exam, attendance and reports
3	5	soil microbiology governs nutrient processing and recycling in soil, and also affects the	- introduces the overall physical and chemical properties of soil particulates controlling the development of soil communities and	lecture&p ractically using lab	Daily and monthly exam, attendance and reports

		decomposition of organic matter in soil, soil salinity and soil acidity, thereby impacting soil fertility and crop health.	their impact on the associated microbial activity.		
4	5	Structure of bacteria components	The soil environment consists of a variety of physical, biological and chemical factors that affect the abundance and diversity of microbes found in the soil knowledge	Lecture.working in lab as group	Daily and monthly exam, attendance and reports
5	5	Classification of bacteria	Classification of bacteria depending on family,class,order,genus	Lecture working in lab as group	Daily and monthly exam, attendance and reports
6	5	History,Classification of fung	Intensive study fungi.structure,nutartion ,physiology	Lecture working in lab as group	Daily and monthly exam, attendance and reports
7	5	History ,Classification of yeast	Intensive study fungi.structure,nutrition ,physiology	Lecture working in lab as group	Daily and monthly exam, attendance and reports
8	5	History ,Classification of algae	Intensive study fungi.structure,nutrition ,physiology	Lecture working in lab as group	Daily and monthly exam, attendance and reports
9	5	History ,Classification of protozoa	Intensive study fungi.structure,nutrition ,physiology classification,Knowledge, skill	Lecture working in lab as group	Daily and monthly exam, attendance and reports
10	5	Protozoa in soil	Intensive study protozoa.structure,nutrition ,physiology,classification Knowledge, skill	Lecture working in lab as group	Daily and monthly exam, attendance and reports
11	5	Soil Humus	Factores on microorganism composition and elements of humus and effects on biodegedation	Lecture working in lab as group	Daily and monthly exam, attendance and reports
12	5	Viruses in soil	Viruses consist of RNA and DNA molecules within protein coats. Viral particles are metabolically inert and do not carry out respiratory or biosynthetic functions	Lecture working in lab as group	Daily and monthly exam, attendance and reports

13	5	The Rhizosphere/Mycorrhizosphere	presents an analysis of rhizosphere/mycorrhizosphere properties with the overall objective of elucidation of the properties of the microbial processes occurring within the rhizosphere and those factors which make it an unique portion of the soil ecosystem.	Lecture working in lab as group	Daily and monthly exam, attendance and reports
14	5	Introduction to the Biogeochemical Cycles	examines the relationships held in common by organisms producing the nutrients and the processes used in the study. It explains that the diversity of organic chemicals and their fate in the soil system	Lecture working in lab as group	Daily and monthly exam, attendance and reports
15	5	Soil Microbes: Optimizers of Soil System Sustainability and Reparation of Damaged Soils	presents a capstone analysis of the importance of management of the microbial community for maximizing the productive and sustainability of soil systems in general and damaged soil systems specifically. It provides a foundation for considering the biological, chemical, and physical	Lecture working in lab as group	Daily and monthly exam, attendance and reports

57.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

58.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Soil Microbiology Author(s):Robert L. Tate First published:30 September 2020 Print ISBN:9780470311103 |Online ISBN:9781119114314 |DOI:10.1002/9781119114314 John Wiley & Sons, Inc. Whitman, William B; ٢٠٢١ ©
Recommended books and references (scientific journals, reports...)	**Web sites of Microbiology**

Course Description Form

1. Course Name:
Soil-Water-Plant Relationships
2. Course Code:
SOPL414
3. Semester / Year:
first semester /fourth year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, numb of units (٢)
7. Course administrator's name (mention all, if more than one name)
Name: Sameerah Faydhllah MOHAMED Email: soil_70@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	The relationship of soil, water and plants is a science that seeks to identify and identify the basic concepts of the relationship of soil, water and plants • Identify the salt balance between the soil-plant-atmosphere system and how this affects • Physiological processes and plant growth. • The various stresses to which the plant is exposed and how to alleviate those stresses. • The relationship of organic matter and microorganisms in plant growth • The relationship between soil salinity and its effect on plant growth, root growth and absorption

9. Teaching and Learning Strategies

Strategy	• Brainstorming • Thinking strategy according to the student's ability, for example (if the student is able to learn analysis methods, he will acquire skill in linking knowledge of the soil's chemical and physical properties and fertility. • Critical Thinking strategy in learning, which is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to reach the desired solution.3- Conduct daily and monthly examinations and prepare practical reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Water, its properties and functions, the physical properties of the soil and their effect on plant growth	**Introduction to the planned experiments and preparing their supplies**	Explanation and display of pictures and Lecture	**Examination**
2	2+3	Water, its properties and functions, the physical properties of the soil and their effect on plant growth	**Comparing the development and growth of roots in soils of different textures**	Explanation and display of pictures and Lecture	**Examination**
3	2+3	Chemical properties of soil and their effect on plant growth and the relationship of water content to soil water potential	**Study of bulk density and its effect on plant growth**	Explanation and display of pictures and Lecture	**Examination**
4	2+3	Chemical properties of soil and their effect on plant growth and the relationship of water content to soil water potential	**The effect of salinity on root development**	Explanation and display of pictures and Lecture	**Examination**
5	2+3	Water and water potential in the soil-plant-air system and the use of mathematical models	**Nutrient preparation and plant behaviour**	Explanation and display of pictures and Lecture	**Examination**
6	2+3	Water and water potential in the soil-plant-air system and the use of mathematical models	**Evaporation and transpiration measurements**	Explanation and display of pictures and Lecture	**Examination**
7	2+3	The various stresses to which the plant is exposed and stress relief	**Calculate the water needs of the plant**	Explanation and display of pictures and Lecture	**Examination**
8	2+3	The various stresses to which the plant is exposed and stress relief	**Follow up on experiments and take notes**	Explanation and display of pictures and Lecture	**Examination**
9	2+3	The various stresses to which the plant is exposed and stress relief	**Follow up on experiments and take notes**	Explanation and display of pictures and Lecture	**Examination**
10	2+3	The relationship of organic matter and soil microbiota to plant growth	**Follow up on experiments and take notes**	Explanation and display of pictures and Lecture	**Examination**
11	2+3	The relationship of organic matter and soil microbiota to plant growth	**Follow up on experiments and take notes**	Explanation and display of pictures and Lecture	**Examination**
12	2+3	Salinity and its effect on plant growth, root	**Discussing related**	Explanation and display of	**Examination**

		13growth and function, efficiency of water use by the plant and influencing factors.	**research and how to present results and graphical forms**	pictures and Lecture	
13	**2+3**	Salinity and its effect on plant growth, root growth and function, efficiency of water use by the plant and influencing factors.	**Analyzing and presenting results and writing reports**	Explanation and display of pictures and Lecture	**Examination**
14	**2+3**	, Salinity and its effect on plant growth, root growth and function, efficiency of water use by the plant and influencing factors	**Discuss the results with all groups**	Explanation and display of pictures and Lecture	**Examination**
15		**Examination**	**Examination**	**Examination**	**Examination**

11. Course Evaluation

Daily and monthly tests

Participate by asking questions that are models of scientific discussions related to the academic subject

Submissions activities through new work and scientific reports

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	النعيمي، سعد الله نجم. ١٩٩٠ . علاقة التربة بالماء والنبات. جامعة الموصل.
Main references (sources)	.
Recommended books and references (scientific journals, reports…)	Soil Science Society Of America Library Genesis.
Electronic References, Websites	Iraqi academic journals, Research gate, US

Course Description Form

1. Course Name:

Hydrology and water resources

2. Course Code:

HYWA415

3. Semester / Year:

first semester/fourth year

4. Description Preparation Date:

31/03/2024

5. Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name: Assist .Prof. Dr. dhahir khaleel Ali **Email:** dhahirgeo@uokirkuk.edu.iq

8. Course Objectives

The course aims to raise the level of students' knowledge about the hydrology and surface water, precipitation ,evaporation , transpiration ,infiltration

9. Teaching and Learning Strategies

Oral discussion about the hydrology and water resources subject and argue question and auditory with visual clearness supporting by real examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Hydrologic cycle and sea an ocean distribution	knowledge	Lecture+practice	Daily and monthly exam, attendance and reports
2	5	precipitation ,evaporation and water losses	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
3	5	The runoff and infiltration	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
4	5	The stream variety	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
5	5	The flood and its consequences	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
6	5	Water storage and it uses	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports

7	5	The water balance	knowledge	lecture+practice	Daily and monthly exam, attendance and hereports
8	5	Factor affecting runoff	knowledge	lecture+practice	Daily and monthly exam, attendance and reports
9	5	The hydrograph and its uses	Knowledge,	lecture+practice	Daily and monthly exam, attendance and reports
10	5	Water reservoirs	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
11	5	The groundwater and its soureces	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
12	5	Groundwater movements	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
13	5	Well drilling	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports
14	5	Stream curves and input calculations	Knowledge,	lecture+practice	Daily and monthly exam, attendance and reports
15	5	The water pollution	Knowledge	lecture+practice	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (5) grades for classroom activity, (20)grade for semi semester test,(15)grade for practice test, the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	.
Main references (sources)	Applied Hydrology. 1978. Ray K. Linsley et al. New York. USA.
Recommended books and references (scientific journals, reports...)	Iraqi and international academic scientific journals
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:
Irrigation Technology Systems
2. Course Code:
IRTE416
3. Semester / Year:
First semester/Fourth year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Professor Dr. Hussain Thahir Tahir Email: hussain.tahir@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**1- The student will be familiar with the types of modern irrigation technologies.** **2- The student should determine the importance of these systems from an economic standpoint.** **3- The student should distinguish between the quality of these systems.**
9. Teaching and Learning Strategies	
Strategy	1- The student must have the ability to choose the appropriate system according to the available capabilities. 2- The student must have the ability to perform the measurements required to evaluate irrigation systems. 3- To implement the knowledge and skills he has learned in his practical life. 4- Enabling students to use modern software and model irrigation movement.

10. Course Structure

		Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2+3**	Show topic data word and Data Show	The concept of irrigation, irrigation in ancient and modern times.	Calculator + Lectures	Daily questions + tests
2	**2+3**	Show topic data word and Data Show	Irrigation water sources. Irrigation water quality.	Calculator + Lectures	Daily questions + tests
3	**2+3**	Show topic data word and Data Show	Introduction to modern irrigation systems, irrigation and water resources in Iraq.	Calculator + Lectures	Daily questions + tests
4	**2+3**	Show topic data word and Data Show	Modern irrigation technologies and soil salinization.	Calculator + Lectures	Daily questions + tests
5	**2+3**	Show topic data word and Data Show	Characteristics of irrigated soil, irrigation water classification systems, and washing requirements.	Calculator + Lectures	Daily questions + tests
6	Semester exam	Show topic data word and Data Show	Water quality and suitability for irrigation.	Calculator + Lectures	Daily questions + tests
7	**2+3**	Show topic data word and Data Show	Different irrigation methods (traditional irrigation systems) and modern irrigation technologies.	Calculator + Lectures	Daily questions + tests
8	**2+3**	Show topic data word and Data Show	Water needs of crops when using modern irrigation systems.	Calculator + Lectures	Daily questions + tests
9	**2+3**	Show topic data word and Data Show	Drip irrigation, moisture distribution pattern in the soil under a drip irrigation system, hydraulic drippers.	Calculator + Lectures	Daily questions + tests
10	**2+3**	Show topic data word and Data Show	Sprinkler irrigation system, advantages and disadvantages of sprinkler irrigation, classification of sprinkler irrigation methods	Calculator + Lectures	Daily questions + tests
11	**2+3**	Show topic data word and Data Show	Operating the sprinkler irrigation system and how to maintain it.	Calculator + Lectures	Daily questions + tests
12	**2+3**	Show topic data word and Data Show	Center pivot irrigation, device components, advantages and disadvantages of the system, calculation of pressure needs.	Calculator + Lectures	Daily questions + tests
13	Semester exam	Show topic data word and Data Show	The Iraqi experience in irrigation technologies, irrigation technology development project.	Calculator + Lectures	Daily questions + tests

14		Show topic data word and Data Show	Comparison of field irrigation systems in terms of efficiency and productivity.	Calculator + Lectures	Daily questions + tests
15		Show topic data word and Data Show	Second month exam	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Modern irrigation technologies and other topics in water resources. 2010. Dr.. Issam Khudair Al-Hadithi and Dr. Ahmed Madloul Al-Kubaisi and Dr. Ya Khudair Al-Hadithi.
Main references (sources)	The Internet in general
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient a modern
Electronic References, Websites	Iraqi academic journals, Resear gate, USGS

Course Description Form

1. Course Name:
Soil Management And Land Use
2. Course Code:
SOMA421
3. Semester / Year:
second semester /fourth year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa number of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Hanan Salah Mahdee Email: Hanansalah@uokirkuk.edu.iq
8. Course Objectives

Course Objectives Enabling the student to know the relationship betw soil classification and land classification, knowing types of lands and their relationship to agricultu production, and knowing the general conditions of pl production and their relationship to soil management	Enabling the student to know the problems Iraqi soil..... Enabling the student to prepare the administrative program and the administrativ map...

9. Teaching and Learning Strategies	
Strategy	A A- Cognitive objectives A1- For the student to become familiar with soil management A2- The student should differentiate between soil and land management A3- Increasing the student's knowledge of how to evaluate lands A4- Knowing the most important problems of Iraqi soil A5- Enabling the student to know the problems of Iraqi soil B- The program's skill objectives B1 - How to employ soil specializations to serve the issue of soil management B2 - Increasing the student's knowledge of how to evaluate lands B3 - Increasing the student's knowledge of different land us

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	2+3	Show topic data word and Data Show	The relationship between pedological sciences and soil management	Calculator + Lectures	Daily questions + tests
3,4	2+3	Show topic data word and Data Show	Surveying and classification tasks in administration	Calculator + Lectures	Daily questions + tests
5,6	2+3	Show topic data word and Data Show	Land classification	Calculator + Lectures	Daily questions + tests
6,7	2+3	Show topic data word and Data Show	Land evaluation	Calculator + Lectures	Daily questions + tests
8,9	2+3	Show topic data word and Data Show	Land uses	Calculator + Lectures	Daily questions + tests
10,11	2+3	Show topic data word and Data Show	Agricultural courses	Calculator + Lectures	Daily questions + tests
12,13	2+3	Show topic data word and Data Show	Administrative programme	Calculator + Lectures	Daily questions + tests
14,15	2+3	Show topic data word and Data Show	Administrative programme	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil Management and Land Use 1990, written by Dr. W. Khaled Al-Akidi
Main references (sources)	. Soil management in planning and land uses 1999, wri by Dr. Muhammad Khader Abbas
Recommended books and references (scientific journals, reports…)	Messages and theses, ancient a modern
Electronic References, Websites	----------

Course Description Form

1. Course Name:
Desertification
2. Course Code:
DESE422
3. Semester / Year:
second semester /fourth year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(2) hours, (2) hours for the theoretical part and, number of units (2)
7. Course administrator's name (mention all, if more than one name)
Name: Sameerah Faydhllah MOHAMED Email: soil_70@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	• Desertification studies the environmental degradation of the Earth • It includes fragile ecosystems and their impact on the expansion of desertification • Researches drought, its causes, and the general consequences of drought • Knowledge of sand dunes and the origin and mineral composition of sand dunes • Study some of the proposals proposed to combat desertification and the methods used to stop the movement of sand dunes • Know the concept of water harvesting, the benefits of water harvesting, the components of water harvesting systems, and the design of water harvesting systems
9. Teaching and Learning Strategies	
Strategy	• Brainstorming • Thinking strategy according to the student's ability, for example (if the student is able to learn analysis methods, he will acquire skill in linking knowledge of the soil's chemical and physical properties and fertility. • Critical Thinking strategy in learning, which is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to reach the desired solution.3- Conduct daily and monthly examinations and prepare practical reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to the concept of desertification and terminology related to desertification	desertification	Explanation and display of pictures and Lecture	Examination
2	2	The problem of desertification, description of the forms of desertification and its causes. Spectacles	desertification	Explanation and display of pictures and Lecture	Examination
3	2	Desertification, its risks, and the losses resulting from it. Desertification globally, Arably, and locally	desertification	Explanation and display of pictures and Lecture	Examination
4	2	Origin of desertification. Vegetation, salinity, drought	desertification	Explanation and display of pictures and Lecture	Examination
5	2	Combat Desertification. Agriculture and permaculture. Water resources and combating desertification, administrative positions in cultural and civil management, land reclamation	desertification	Explanation and display of pictures and Lecture	Examination
6	2	Sand dunes as a manifestation of desertification. Area distribution of sand dunes locally and their spread globally.	desertification	Explanation and display of pictures and Lecture	Examination
7	2	The origin of the sand dune problem. Sand dunes and sand dunes. Methods and means of stabilizing and combating sand dunes	desertification	Explanation and display of pictures and Lecture	Examination
8	2	Means and methods for measuring desertification and sand dunes. Erosion measurement. Measuring the ability of soil to be removed. Measuring loss and addition	desertification	Explanation and display of pictures and Lecture	Examination
9	2	Drought and aridity. Definition of drought and aridity and the factors causing them.	desertification	Explanation and display of pictures and Lecture	Examination
10	2	Results of drought and aridity. Ways to live with drought	desertification	Explanation and display of pictures and Lecture	Examination
11	2	Global Warming. The concept of global warming.	desertification	Explanation and display of pictures and Lecture	Examination
12	2	Causes of global warming. Some methods of treating retention	desertification	Explanation and display of pictures and Lecture	Examination
13	2	Water harvesting. Water harvesting concept. Water harvesting methods.	desertification	Explanation and display of pictures and Lecture	Examination
14	2	Factors that determine the choice of harvesting methods	desertification	Explanation and display of pictures and Lecture	Examination
15	2	the exam	Examination	Examination	Examination

11. Course Evaluation Daily and monthly tests Participate by asking questions that are models of scientific discussions related to the academic subject Submissions activities through new work and scientific reports	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- صحر. تدهور الاراضي في المناطق الجافة. تاليف د. محمد عبد الفتاح القصاص. منشورات دار المعرفة. ١٩٩٩.
Main references (sources)	1- 1- صحر تأليف د.ماجد خضير عباس و د.عبد الأمير ي صالح ، ٢٠١٢ وزارة التعليم العالي والبحث العلمي – جامعة بغداد
Recommended books and references (scientific journals, reports…)	Iraqi academic journals, Research gate.
Electronic References, Websites	Soil Science Society Of America Library Genesis

Course Description Form

1. Course Name:

Plant Nutrition

2. Course Code:

PLNU423

3. Semester / Year:

Second semester/Fourth year

4. Description Preparation Date:

31/03/2024

5. Available Attendance Forms:

Mandatory

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

(5) Hours, Number of units (3)

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

Name: Asst.Prof. Dr. Ali Mohammed NOORI **Email:** aloky1515@uokirkuk.edu.iq

8. Course Objectives

The course aims to introduce the student to the characteristics of plant nutrients and their relationship to the physiological and structural role of plants.

9. Teaching and Learning Strategies

1- Follow the lecture method and use modern presentation methods.
2- Conduct laboratory experiments.
3- Direct dialogue with students through the daily exam.
4- Homework assignments (writing scientific reports).

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Definition of plant nutrition and plant content of elements	knowledge	lecture	Daily and monthly exam, attendance and reports
2	5	Soil as a medium for nutrients	knowledge	lecture	Daily and monthly exam, attendance and reports
3	5	Absorption of nutrients and theories of absorption	knowledge	lecture	Daily and monthly exam, attendance and reports
4	5	Representation of elements and their transport within the plant	knowledge	lecture	Daily and monthly exam, attendance and reports
5	5	Representation of elements and their transport within the plant	knowledge	lecture	Daily and monthly exam, attendance and reports
6	5	Representation of elements and their transport within the plant	knowledge	lecture	Daily and monthly exam, attendance and reports
7	5	Water, plant nutrition, and the relationship between nutrition and yield	knowledge	lecture	Daily and monthly exam, attendance and reports
8	5	Water, plant nutrition, and the relationship between nutrition and yield	knowledge	lecture	Daily and monthly exam, attendance and reports
9	5	Salinity and plant nutrition	knowledge	lecture	Daily and monthly exam,

					attendance and reports
10	5	Nutrition and plant diseases	knowledge	lecture	Daily and monthly exam, attendance and reports
11	5	Nutrition and gut diseases	knowledge	lecture	Daily and monthly exam, attendance and reports
12	5	Symptoms of element deficiency	knowledge	lecture	Daily and monthly exam, attendance and reports
13	5	Pollution and plant nutrition	knowledge	lecture	Daily and monthly exam, attendance and reports
14	5	Soilless agriculture	knowledge	lecture	Daily and monthly exam, attendance and reports
15	5	How to prepare nutritional solutions	knowledge	lecture	Daily and monthly exam, attendance and reports

11.Course Evaluation

The grade for the semester examination is (40%), divided into (10) grades for daily preparation, participation, and submitting reports, (30) grades for monthly exams, with two monthly exams for each exam (15) grades, and the grade for the final exam is (60%).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the teacher based on relevant books and references.
Main references (sources)	Plant Nutrition
Recommended books and references (scientific journals, reports...)	Iraqi academic scientific journals, including Kirkuk University Journal of Agricultural Sciences
Electronic References, Websites	International journals included in Scopus

Course Description Form

1. Course Name:

Fertilizers Technology

2. Course Code:

FETE424

3. Semester / Year:

Second semester/Fourth year

4. Description Preparation Date:

3/4/2024

5. Available Attendance Forms:

Is mandatory

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

(5) hours, (2) hours for the theoretical part and (3) hours for the practical pa
number of units (3)

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

Name: Hanan Salah Mahdee
Email: : Hanansalah@uokirkuk.edu.iq

8. Course Objectives

Course Objectives	**It examines the sources of fertilizers, whether organic or chemical, and their types. It also examines the types of nitrogen fertilizers, their uses, classification, and manufacturing.**

9. Teaching and Learning Strategies

Strategy	A- Cognitive objectives A1- The student gets to know the concept of fertilizer technology A2- The student should describe the types of fertilizers A3- The student should know how to make every fertilizer A4- Every fertilizer must be chemically analyzed A5- To know how to add each fertilizer A6- To know the reactions of fertilizers in the soil B - The program's skill objectives B1 - That the student can distinguish between different fertilizers B2 - To know the relationship of each fertilizer to the plant B3 - To know the environmental effects of using each fertilizer

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	4+6	Identify the different types of fertilizers in terms of shape, color, crystallization and	Modern concepts related to fertilizers and their uses	Calculator + Lectures	Daily questions + tests

		analysis			
3	3+2	Conduct some laboratory analyzes to determine the solubility, pH, salt index, and nutrient ratios of different fertilizers.	**Fertilizer classification**	Calculator + Lectures	Daily questions + tests
4	3+2	Carrying out a field experiment or pot experiment to identify the plant's response to different fertilizer sources or fertilizer levels	**organic fertilizers**	Calculator + Lectures	Daily questions + tests
5	3+2	Detection of biuret in urea	**Mineral fertilizers: Nitrogen fertilizers, their uses, classification and manufacturing**	Calculator + Lectures	Daily questions + tests
6	3+2	Fertilizer calculations	**Phosphorous fertilizers, their uses, classification and manufacturing**	Calculator + Lectures	Daily questions + tests
7	Semester exam	Show topic data word and Data Show	**Potassium fertilizers, their uses, classification and manufacturing**	Calculator + Lectures	Daily questions + tests
8	3+2	Show topic data word and Data Show	**Calcium, magnesium and sulfur fertilizers**	Calculator + Lectures	Daily questions + tests
9	3+2	Show topic data word and Data Show	**Compound fertilizers, their uses, classification and manufacturing**	Calculator + Lectures	Daily questions + tests
10	3+2	Show topic data word and Data Show	**Micronutrient fertilizers and chelated fertilizers, their uses and manufacturing**	Calculator + Lectures	Daily questions + tests
11	3+2	Show topic data word and Data Show	**Liquid fertilizers, preparation methods**	Calculator + Lectures	Daily questions + tests

			and uses		
12	3+2	Show topic data word and Data Show	**Methods of adding fertilizers**	Calculator + Lectures	Daily questions + tests
13	3+2	Show topic data word and Data Show	**Evaluation of mineral and organic fertilizers**	Calculator + Lectures	Daily questions + tests
14	3+2	Show topic data word and Data Show	Fertilizer recommendations and optimal methods for an ideal fertilizer recommendation	Calculator + Lectures	Daily questions + tests
١5	3+2	Show topic data word and Data Show	**Fertilizers and environmental pollution**	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Ali, Nour al-Din Shawqi, 2010, Fertilizer Technologies and Their Uses, College of Agriculture, University of Baghdad. (under publication) 2- Hassan, Nouri Abdel Qader, Hassan Al-Dulaimi, and Latif Al-Ithawi, 1990. Soil fertility and fertilizers, Ministry of Higher Education and Scientific Research. Baghdad University.
Main references (sources)	3- Al-Naimi, Saadallah (1999) Fertilizers and soil fertility. Ministry of Higher Education and Scientific Research, University of Mosul.
Recommended books and references (scientific journals, reports…)	**Havlin, J.L., Tisdale, S.L., Nelson, W.L., and Beaton, J.D. 2005, Soil Fertility and Fertilizers, 5th edition. USA**
Electronic References, Websites	----------

Course Description Form

1. Course Name:
Land Reclamation
2. Course Code:
LARE425
3. Semester / Year:
Second semester/Fourth year
4. Description Preparation Date:
3/4/2024
5. Available Attendance Forms:
Is mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(5) hours, (2) hours for the theoretical part and (3) hours for the practical part, numb of units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Hanan Salah Mahdee Email: : Hanansalah@uokirkuk.edu.iq
8. Course Objectives

Course Objectives	**For the student to recognize the problem of soil salinity and its impact on agricultural production.** **For the student to recognize the problem of soil salinity and its impact on agricultural production.**
9. Teaching and Learning Strategies	
Strategy	A- Cognitive objectives A1- The student will understand the conditions and factors that lead to soil salinization, as well as the sources and theories of salinization A2- The student should recognize the types of salts accumulated in the soil A3- The student will learn about the effect of salinity on plant growth and its relationship to agricultural production A4- The student will learn how to implement saline soil reclamation programs B - The program's skill objectives B1 - Analysis and diagnosis of salinity indicators in the field and laboratory. B2 - The ability to analyze soil data obtained in the field and

	laboratory B3 - How to plan and implement various soil reclamation programs B4- Obtaining soil salinity and soil data and applying it to determi the relative yield

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4+6	Experimenting with the effect of salinity on seed germination	The problem of salinity and its impact on agricultural production: the problem of salinity in the world, the problem of salinity in Iraq, the problem of salinity and agricultural production.	Calculator + Lectures	Daily questions + tests
2	**2+3**	Experimenting with the effect of salinity on wheat growth in the greenhouse.	Sources of salt components: sources of salts in nature and their accumulation in soils affected by salts, weathering of rocks and minerals, seas and oceans, volcanoes, means and mechanisms of transfer of salts to the soil.	Calculator + Lectures	Daily questions + tests
3	**2+3**	Carrying out a field experiment or pot experiment to identify the plant's response to different fertilizer sources or fertilizer levels	**Formation conditions of soils affected by salts: Dissolution of accumulated salts in saline soil Phases of salt accumulation in saline soils**	Calculator + Lectures	Daily questions + tests
4	**2+3**	Methods of expressing soil salinity	**Cycles of salt**	Calculator + Lectures	Daily questions + tests

			accumulation in nature and their relationship to the formation of soils affected by salts.		
5	**2+3**	Determination of dissolved ions in soil and water extract using the elution method	**Water and salt balance in the soil and its relationship to salinity**	Calculator + Lectures	Daily questions + tests
6	Semester exam	Determination of dissolved ions by the optical flame method	**Chemical and physical properties of salts accumulated in salt–affected soils**	Calculator + Lectures	Daily questions + tests
7	**2+3**	Conduct an experiment on soil salinization	**Phases of salt accumulation in saline soils**	Calculator + Lectures	Daily questions + tests
8	**2+3**	Conducting saline soil analyses	**Cation exchange in soils affected by salts The effect of soil salinity on plants**	Calculator + Lectures	Daily questions + tests
9	**2+3**	Show topic data word and Data Show	**Experimental relationship between the sodium adsorption rate and the percentage of sodium exchanged**	Calculator + Lectures	Daily questions + tests
10	**2+3**	Show topic data word and Data Show	**Ways to express salinity and the effect of soil salinity on plants**	Calculator + Lectures	Daily questions + tests

11	**2+3**	Show topic data word and Data Show	**Classification and naming of soils affected by salts, salinity maps, and classification of soils affected by salts in Iraq**	Calculator + Lectures	Daily questions + tests
12	**2+3**	Show topic data word and Data Show	**The effect of irrigation water types on soil and plants**	Calculator + Lectures	Daily questions + tests
13,14	6+4	Show topic data word and Data Show	The dangers of salinity to the soil, controlling salinity and ways to live with it	Calculator + Lectures	Daily questions + tests
15	Semester exam	Show topic data word and Data Show	Semester exam	Calculator + Lectures	Daily questions + tests

11. Course Evaluation

Daily and monthly tests through questions presented to them on the subject studied
Degrees are awarded for student participation in scientific research and reports
Student activities by creating posters and illustrations related to the academic subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book on agricultural land reclamation, Ahmed Haider Al-Zubaidi.
Main references (sources)	----------
Recommended books and references (scientific journals, reports…)	----------
Electronic References, Websites	----------

Course Description Form

1. Course Name:
English language / 4
2. Course Code:
ENLA426
3. Semester / Year:
Second semester/ fourth year
4. Description Preparation Date:
31/03/2024
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hour
7. Course administrator's name (mention all, if more than one name)
Name: Berevan Qader Omar **Email:** beree.omer@gmail.com
8. Course Objectives
Teaching this curriculum aims to make the student familiar with the English language as it is a global language from which the students will benefit widely in their academic life. This curriculum is an extension of what the students learned in the previous three stages.
9. Teaching and Learning Strategies
It is a semi-integrated curriculum for the intermediate level, which includes the necessary basics for learning the English language for the intermediate level, along with exercises. It includes auxiliary verbs and four types of verb tenses, with an explanation of each tense in the form of the affirmative, negative, and question. It also includes an introduction to the modal verbs regarding permission, Obligation and how to make offer and request, as well as an introduction to the future tense.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introduction to modal auxiliary verbs	Knowledge	lecture	Exercise
2	1	Tenses and auxiliary	Knowledge	lecture	Exercise

		verbs			
3	1	Negative and auxiliary verbs	Knowledge	lecture	Exercise
4	1	Question and auxiliary verbs	Knowledge	lecture	Exercise
5	1	Present simple for intermediate level	Knowledge	lecture	Exercise
6	1	Present continuous for intermediate level	Knowledge	lecture	Quiz
7	1	Past simple for intermediate level	Knowledge	lecture	Exercise
8	1	Past continuous for intermediate level	Knowledge	lecture	Exercise
9	1	Modal verbs	Knowledge	lecture	Exercise
10	1	Modal verbs of obligation and permission	Knowledge	lecture	quiz
11	1	Should, ought to , must	Knowledge	lecture	quiz
12	1	Making request	Knowledge	lecture	Exercise
13	1	Making offers	Knowledge	lecture	Exercise
14	1	Introduction to future	Knowledge	lecture	Exercise
15	1	Future with facts and predictions	Knowledge	lecture	Quiz

11.Course Evaluation

Semester endeavor (40 marks): 15 marks for the first month exam + 5 marks for quiz
15 marks for second month exam + 5 marks for quiz
Final exam (60 marks)

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	New headway plus (elementary student bo / written by : Liz and John Soars / Oxf university press
Main references (sources)	Cambridge press
Recommended books and references (scientific journals, reports...)	My English library website
Electronic References, Websites	You tube and some useful websites