Course Description Form

1. Course Name:

Fertilizer technologies

2. Course Code: :

AGSW24-F4111

3. Semester / Year: Aumtumn

second fall semester / 2024-2025

4. Description Preparation Date:

1-2-2025

5. Available Attendance Forms: Mandatory

The presence + online

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

2 Theoretical+ 3 practical

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

Name: Dr. Rana Saadallah Aziz
Name :A.T reem waleed abdalgabbar
Name :A.T Marwan Mahmod Yassen

8. Course Objectives

Course Objectives

Theoretical part:

1. Student education how to take soil models or plant from the field.
2. Detailed knowledge of the most important food and micro nutrients and how to use fertilizers to provide plant to th elements.
3. Identify chemical fertilizer types.
4. **Student education means used in the assessment of forefront and knowledge of the amount of fertilizer and scientific.**
5. **Kneads and places manufacturing chemical fertilizer.**
6. **Students towards desire to have better experiences when submitting graduate studies.**
7. **How to add chemical fertilizers and accounts.**

practical part

- Detection of types of chemical fertilizers And practical experiments to determine the type of these fertilizers.

9. Teaching and Learning Strategies

Theoretical: - Interactive lecture. - Dialogue and discussion. - Assigning tasks and reporting. - Brainstorming . - Special offers on chemical fertilizer manufacturing models.	Practical: - Assigning group work to reveal skills Student leadership. - Assigning tasks and a report for each lecture

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 Practical	Theoretical: shows For the student an introduction to Fertilizer technologies Definitions of types of fertilizers and their purpose them and then classify them Practical: a general idea about each Types of fertilizers, purpose of fertilization, classification of fertilizers.	Theoretical: Introduction to fertilizer technology, objective, Sources, general definitions, general idea For all types of fertilizers, their purpose Fertilization, classification of fertilizers. Practical: Shows the student how to classify fertilizers and the purpose of fertilization	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
2	2 Theoretical 3 Practical	Theoretical: Explains to the student the salt index for fertilizers How to calculate it,with an explanation of the most important points To store fertilizers Practical How to find and calculate the salt index for fertilizers :	Salt Index for fertilizers and how to calculate it, Fertilizer movement, fertilization methods, Points to consider when storing Fertilisers. Practical: It explains to the student what the salt index is, why it is important, what the salt index is, as well as the importance of fertilizers and how to store them.	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
3	2 Theoretical	Theoretical: definition	Manufacture of phosphate fertilizers,	Theoretical: Methods	Short exams,

	3 Practical	Student through methods Fertilizer manufacturing Phosphate including Phosphoric acid, superphosphate fertilizer Regular, triple, concentrated and fertilizer Ammonium phosphate and urea phosphate. Practical: Phosphate fertilizers, standard specifications for phosphate fertilizers, detection of fertilizers	phosphoric acid, and superphosphate fertilizer Regular, triple superphosphate fertilizer, concentrated superphosphate fertilizer, fertiliser Ammonium phosphate, urea phosphate. Practical: Introducing the student to how to detect phosphate fertilizers, and knowing the percentage of phosphorus in these fertilizers	audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	assigned assignments and discussions.
4	2 Theoretical 3 Practical	Theoretical: recognize Student at the fertilizer complex in Al-Qaim And each unit of Complex units Explaining the steps of its production. Practical: Manufacturing different types of nitrogen and phosphate fertilizers	Fertilizer complex in Al-Qaim, with a mention, explanation and detail of each unit of the complex, and production steps for each type Fertilisers. Practical: Introducing the student to methods of manufacturing different types of fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
5	2 Theoretical 3 Practical	Theoretical: recognize The student is more important Nitrogen solutions with slow clarification nitrogen fertilizers Liberation and recognition On the forms of packaging Practical: Nitrogen fertilizers Standard specifications for nitrogen fertilizers and slow-release fertilizers	Nitrogen solutions, slow-release nitrogen fertilizers, slow-release compounds in water, forms of packaging, environmental problems For nitrogen fertilizers. Practical: The student learns about the types of slow-release fertilizers, and the purpose of packaging fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.

6	2 Theoretical 3 Practical	Theoretical: recognize The student is on the road Fertilizer evaluation And methods of mixing them And examples of it. Practical: Fertilizer evaluation Fertilizer mixing guide	Fertilizer evaluation and mixing, descriptive and quantitative evaluation of fertilizers, fertilizer mixing guide, Examples of mixing fertilizers. Practical: The student learns about the foundations of evaluating fertilizers and how to mix fertilizers using mathematical methods	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
7	2 Theoretical 3 Practical	Theoretical: recognize Student on fertilizers, especially those containing... On potassium, its forms, factors affecting readiness, and its sources and types. Practical: Potassium fertilizers, factors affecting the readiness of these fertilizers, calculating the percentage of potassium in these fertilizers.	Fertilizers containing potassium, forms of potassium in the soil, factors affecting the readiness of potassium, its sources, types of potassium fertilizers, potassium chloride, potassium sulphate, potassium nitrate. Practical: The student learns On how to detect potassium fertilizers, and methods of manufacturing these Fertilisers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
8	2 Theoretical 3 Practical	Theoretical: The student becomes familiar with the financial advice and its objectives Its methods and components, while introducing the student to the critical limits of major and minor elements. Practical: Definition of fertilizer recommendation Its goals, methods and components	The Samadhi recommendation is defined as its objectives Its methods, components, plant analysis, Critical limits for macro and micro nutrients. Practical: Introducing the student to the importance of the fertilizer recommendation and its purpose	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.

9	2 Theoretical 3 Practical	heoretical: It explains the most important organic fertilizers, their importance, the differences between them and mineral fertilizers, their sources, and the factors affecting their decomposition, while giving examples of organic fertilizers. Practical: Estimating the percentage of organic carbon in fertilizer, estimation The percentage of total nitrogen in Fertilizer	Organic fertilizers, their importance, division Organic fertilizers, differences between organic and chemical fertilizers, notes that This must be taken into account when choosing fertilizers Organic matter, its sources, types, methods of adding it, factors affecting decomposition Organic fertilizer, examples of calculating the amount of organic fertilizer. Practical: Conduct laboratory experiments to calculate the percentage of organic carbon and the percentage of total nitrogen in organic fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Conducting weekly oral or written tests.
10	2 Theoretical 3 Practical	Theoretical: recognize The student receives fertilizers containing calcium and magnesium Knowing its critical limits and clarifying its problems in Iraqi soil. Practical: The importance of fertilizers containing calcium and magnesium, standard specifications for these fertilizers	Fertilizers containing calcium and magnesium and their critical limits and problems in Iraqi soils Practical: Explains to the student how to detect these fertilizers and methods of manufacturing them	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
11	2 Theoretical 3 Practical	Theoretical: Explains. Fertilizers for the student Major elements	Micronutrient fertilizers (iron, zinc, manganese, boron, copper, molybdenum.	Theoretical: Methods audio Style of writing on the blackboard	Short exams, assigned assignments

		Practical: The importance of micronutrient fertilizers, standard specifications, and determinants of using these fertilizers	Practical: Explains to the student how to detect these fertilizers and methods of manufacturing them	Direct dialogue style Practical: Assigning tasks and reporting	and discussions.
12	2 Theoretical 3 Practical	Theoretical: The student learns about the element sulfur, its limits, and its problems in Iraqi soil. Practical: sulfur fertilizers, types of sulfur fertilizers, standard specifications	Sulfur and its presence Sulfur as a critical boundary conditioner has its benefits and problems in the soil. Practical: Instructing students on how to find the percentage of sulfur in these fertilizers, conducting laboratory experiments to detect these fertilizers.	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
13	2 Theoretical 3 Practical	Theoretical: Explains to the student the methods of manufacturing fertilizers and their problems Practical: Fertilizer manufacturing methods	Fertilizer industry, raw materials used in manufacturing, its problems Practical: Introducing the student to the materials used in the manufacture of fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
14	2 Theoretical 3 Practical	Theoretical: Explains to the student the types of nitrogen fertilizers and their use as fertilizer. Practical: Standard specifications for nitrogen fertilizers, methods of using these fertilizers	Nitrogen fertilizer, anhydrous ammonia, ammonium nitrate, urea, hydrolyzate Urea in the soil and used as fertilizer. Practical: Introducing the student to how to detect nitrogen fertilizers, and methods of manufacturing these fertilizers	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style Practical: Assigning tasks and reporting	Short exams, assigned assignments and discussions.
15	2 Theoretical 3 Practical	Theoretical: The student will become familiar with the most important electronic instructions and problems and the	Guidance and associated environmental problems Using fertilizers, optimal use	Theoretical: Methods audio Style of writing on the blackboard Direct dialogue style	Short exams, assigned assignments and discussions.

		optimal use of brand name techniques. Practical: Methods of dealing with fertilizers, and how to add these fertilizers to the soil	Chemical fertilizer technologies in Iraqi agriculture. Practical: Introducing the student to the most important guidelines used in using fertilizers and how to use them	Practical: Assigning tasks and reporting	

11. Course Evaluation

T	Calendar methods	Calendar date (week)	Class	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15.	7 theoretical + 6 practical	13%
2	Short test (1) Quiz	week (3)	4 theoretical + 2 practical	6%
3	Midterm Exam (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	Short test Quiz(2)	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exams week	20	20%
6	Final theoretical test	The week of theoretical exams	40	40%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fertilizer technologies book.
Main references (sources)	1. Lectures prepared from the Internet. 2. Fertilizer technologies by Dr. Nour El-Din Shawky Ali 2007.
Recommended books and references (scientific journals, reports...)	1. Fertilizers and soil fertility. Written by Dr. Saadallah Najm Abdullah Al-Naimi 1999. College of Agriculture / University of Mosul. 2. Fertilization and soil fertility. Written by Dr. Kazem Mashhout Awad 1987. College of Agriculture / University of Basra.
Electronic References, Websites	FAO

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