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 the elements.
- 3. Identify chemical fertilizer types.
- 4. Student education means used in the assessment of forefront and knowledge

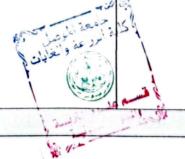
of the amount of fertilizer and scientific.

- 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.

9. Teaching and Learning Strategies

practical part

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



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

| Wee Hours | | Required Learning | Unit or subject name | Learning method | Evaluation | |
|-----------|---|-------------------------|--|--|---|--|
| k | | Outcomes | Miles and the control of | | method | |
| 1 | | | 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 | Theoretical: 2 Theoretical 3 Practical 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 | phosphoric acid, and superphosphate | audio Style of writing on | assigned assignments |
|-------|------------------|--------------------------|-------------------------------------|----------------------------------|-------------------------|
| | | Fertilizer | fertilizer | the blackboard | and |
| | | | | | discussions. |
| | | manufacturing | Regular, triple | Direct dialogue style Practical: | discussions. |
| | | Phosphate including | superphosphate | | |
| | | Phosphoric acid, | fertilizer, concentrated | Assigning tasks and | |
| | | superphosphate | superphosphate | reporting | |
| | | fertilizer | fertilizer, fertiliser | | |
| | | Regular, triple, | Ammonium | | |
| | | concentrated and | phosphate, urea | | |
| | | fertilizer | phosphate. | | |
| | | Ammonium | Practical: Introducing | | |
| | | phosphate and urea | the student to how to | | |
| | | phosphate. | detect phosphate | | |
| | | Practical: Phosphate | fertilizers, and | | |
| | | fertilizers, standard | knowing the | | |
| | | specifications for | percentage of | | |
| | | phosphate fertilizers, | phosphorus in these | | |
| | | detection of fertilizers | fertilizers | | |
| | | Theoretical: recognize | Fertilizer complex in | Theoretical: | Short |
| 4 | 2 Theoretical | Student at the | Al-Qaim, with a | Methods | exams, |
| | 3 Practical | fertilizer complex in | mention, explanation | audio | assigned |
| | | Al-Qaim | and detail of each unit | Style of writing on | assignments |
| | | And each unit of | of the complex, and | the blackboard | and |
| | | Complex units | production steps for | Direct dialogue style | discussions. |
| | | Explaining the steps | each type | Practical: | |
| | | of its production. | Fertilisers. | Assigning tasks and | |
| | | | Practical: | reporting | |
| | | Practical: | Introducing the | | |
| | | Manufacturing | student to methods of | | |
| | | different types of | manufacturing | | |
| | | nitrogen and | different types of | | |
| | | phosphate fertilizers | fertilizers | | |
| 5 | 2 Theoretical | Theoretical: recognize | Nitrogen solutions, | Theoretical: | Short |
| | 3 Practical | The student is more | slow-release nitrogen | Methods | exams, |
| | | important | fertilizers, slow- | audio | assigned |
| | | Nitrogen solutions | release compounds in | Style of writing on | assignments |
| | | with slow clarification | water, forms of | the blackboard | and |
| | | nitrogen fertilizers | packaging, | Direct dialogue style | discussions. |
| | | Liberation and | environmental | Practical: | |
| | | recognition | problems | Assigning tasks and | |
| | | On the forms of | For nitrogen | reporting | |
| | | packaging | fertilizers. | | |
| | 2 44 | Parametris | | | |
| | 730 00 | Practical: Nitrogen | Practical: The student | | |
| 61. 5 | 1 Strains of | fertilizers | learns about the types | | |
| 1 | | Standard | of slow-release | | |
| 1 :31 | 6. | specifications for | fertilizers, and the | | |
| 1 | (* * · .) | nitrogen fertilizers and | purpose of packaging | | |
| 1 | 1/20 | | purpose of packaging | I | I |
| 1 | سمع عليان | | | | |
| 1 | سبه عشوه التوسية | slow-release fertilizers | fertilizers | | |

| | | | | | (1) |
|---|--|---|----------------------------|-----------------------|--------------|
| | | Theoretical: recognize | Fertilizer evaluation | Theoretical: | Short |
| 6 | 2 Theoretical | The student is on the | and mixing, | Methods | exams, |
| | 3 Practical | road | descriptive and | audio | assigned |
| | | Fertilizer evaluation | quantitative evaluation | Style of writing on | assignments |
| | | And methods of | of fertilizers, fertilizer | the blackboard | and |
| | | mixing them | mixing guide, | Direct dialogue style | discussions. |
| | | And examples of it. | Examples of mixing | Practical: | |
| | | Practical: Fertilizer | fertilizers. | Assigning tasks and | |
| | | evaluation | Practical: The student | reporting | |
| | | Fertilizer mixing | learns about the | | |
| | | guide | foundations of | | |
| | | | evaluating fertilizers | | |
| | | | and how to mix | | |
| | | | fertilizers using | | |
| | | | mathematical methods | | |
| | | Theoretical: recognize | Fertilizers containing | Theoretical: | Short |
| 7 | 2 Theoretical | Student on fertilizers, | potassium, forms of | Methods | exams, |
| | 3 Practical | especially those | potassium in the soil, | audio | assigned |
| | | containing | factors affecting the | Style of writing on | assignments |
| | | On potassium, its | readiness of | the blackboard | and |
| | | forms, factors | potassium, its sources, | Direct dialogue style | discussions. |
| | | affecting readiness, | types of potassium | Practical: | |
| | | and its sources and | fertilizers, potassium | Assigning tasks and | |
| | | types. | chloride, potassium | reporting | |
| | | Practical: Potassium | sulphate, potassium | | |
| | | fertilizers, factors | nitrate. | | |
| | | affecting the readiness | Practical: The student | | |
| | | of these fertilizers, | learns | | |
| | | calculating the | On how to detect | | |
| | | percentage of | potassium fertilizers, | | |
| | | potassium in these | and methods of | | |
| | | fertilizers. | manufacturing these | | |
| | | | Fertilisers | | |
| | | Theoretical: The | The Samadhi | Theoretical: | Short |
| 8 | 2 Theoretical | student becomes | recommendation is | Methods | exams, |
| | 3 Practical | familiar with the | defined as its | audio | assigned |
| | | financial advice and | objectives | Style of writing on | assignments |
| | | its objectives | Its methods, | the blackboard | and |
| | | Its methods and | components, plant | Direct dialogue style | discussions. |
| | | components, while | analysis, | Practical: | |
| | | introducing the | Critical limits for | Assigning tasks and | |
| | | student to the critical | macro and micro | reporting | |
| | | limits of major and | nutrients. | | |
| | | minor elements. | Practical: Introducing | | |
| | , | | the student to the | | |
| | | Practical: Definition | importance of the | | |
| | 15 ye w | of fertilizer | fertilizer | | |
| | المراجع المراج | recommendation | recommendation and | | |
| | 1 (3 | Its goals, methods | its purpose | | |
| | / | and components | II | | |
| | 1 27 | 111111111111111111111111111111111111111 | | | |

| | 1 | | 0 | Theoretical: | Conducting |
|----|---------------|-------------------------|--|-----------------------|--------------|
| _ | 2.77 | heoretical: | Organic | Methods | weekly oral |
| 9 | 2 Theoretical | It explains the most | fertilizers, their | audio | or written |
| | 3 Practical | important organic | importance, division | | tests. |
| | | fertilizers, their | Organic fertilizers, | Style of writing on | tests. |
| | | importance, the | differences between | the blackboard | |
| | | differences between | organic and chemical | Direct dialogue style | |
| | | them and mineral | fertilizers, notes that | Practical: | |
| | | fertilizers, their | This must be taken | Assigning tasks and | |
| | , | | into account when | reporting | |
| | | factors affecting their | choosing fertilizers | | |
| | | decomposition, while | Organic matter, its | | |
| | | giving examples of | sources, types, | | |
| | | organic fertilizers. | methods of adding it, | | |
| | | Practical: Estimating | factors affecting | | |
| | | the percentage of | decomposition | | |
| | | organic carbon in | Organic fertilizer, | | |
| | | fertilizer, estimation | examples of | | |
| | | The percentage of | calculating the amount | | |
| | | total nitrogen in | of organic fertilizer. | | |
| | | Fertilizer | Practical: Conduct | | |
| | | | laboratory | | |
| | | | experiments to calculate the | | |
| | | | | | |
| | | | percentage of organic carbon and the | | |
| | | | | | |
| | | | percentage of total nitrogen in organic | | |
| | | | fertilizers | | |
| | | Theoretical: recognize | Fertilizers containing | Theoretical: | Short |
| 10 | 2 Theoretical | The student receives | calcium and | Methods | exams, |
| 10 | 3 Practical | fertilizers containing | magnesium and their | audio | assigned |
| | 3 Tractical | calcium and | critical limits and | Style of writing on | assignments |
| | | magnesium | problems in Iraqi soils | the blackboard | and |
| | | Knowing its critical | Practical: Explains to | Direct dialogue style | discussions. |
| | | limits and clarifying | the student how to | Practical: | |
| | | its problems in Iraqi | detect these fertilizers | Assigning tasks and | |
| | | soil. | and methods of | reporting | |
| | | Son. | manufacturing them | | |
| | | Practical: The | I management | | |
| | | importance of | | | |
| | | fertilizers containing | | | |
| | | calcium and | | | |
| | | magnesium, standard | | | |
| | | specifications for | | | |
| | | these fertilizers | | | |
| | | Theoretical! Explains. | Micronutrient | Theoretical: | Short |
| 11 | 2 Theoretical | | fertilizers (iron, zinc, | Methods | exams, |
| ** | 3 Practical | student | manganese, boron, | audio | assigned |
| | 3 Tractical | Major elements | copper, molybdenum. | Style of writing on | assignments |
| | , | | - Spring mony commin | the blackboard | |
| | 1 | | | in older could | |

| | 1 | Described The | Denetical: Evelsing to | Direct dialogue style | and |
|----|---------------|---------------------------|--------------------------|---------------------------------------|--------------|
| | | Practical: The | Practical: Explains to | Direct dialogue style Practical: | discussions. |
| | | importance of | the student how to | | discussions. |
| | | micronutrient | detect these fertilizers | Assigning tasks and | |
| | | fertilizers, standard | and methods of | reporting | |
| | | specifications, and | manufacturing them | | |
| | | determinants of using | | | |
| | | these fertilizers | | | |
| | | Theoretical: The | Sulfur and its presence | Theoretical: | Short |
| | | student learns about | Sulfur as a critical | Methods | exams, |
| 12 | 2 Theoretical | the element sulfur, its | boundary conditioner | audio | assigned |
| | 3 Practical | limits, and its | has its benefits and | Style of writing on | assignments |
| | | problems in Iraqi soil. | problems in the soil. | the blackboard | and |
| | | | Practical: Instructing | Direct dialogue style | discussions. |
| | | Practical: | students on how to | Practical: | |
| | | sulfur fertilizers, types | find the percentage of | Assigning tasks and | |
| | | of sulfur fertilizers, | sulfur in these | reporting | |
| | | standard specifications | fertilizers, conducting | | |
| | | Standard specifications | laboratory | | |
| | | | experiments to detect | | |
| | | | these fertilizers. | | |
| | | Theoretical: Explains | Fertilizer industry, | Theoretical: | Short |
| 13 | 2 Theoretical | to the student the | raw materials used in | Methods | exams, |
| 13 | 3 Practical | methods of | manufacturing, its | audio | assigned |
| | 3 Fractical | manufacturing | problems | Style of writing on | assignments |
| | | fertilizers and their | Practical: Introducing | the blackboard | and |
| | | problems | the student to the | Direct dialogue style | discussions. |
| | | problems | materials used in the | Practical: | discussions. |
| | | | manufacture of | Assigning tasks and | |
| | | Practical: Fertilizer | fertilizers | reporting | |
| | | | lerunzers | reporting | |
| | | manufacturing | | | |
| | | methods | Nitragan fastilizas | Theoretical: | Short |
| | | Theoretical: Explains | Nitrogen fertilizer, | Methods | |
| 14 | 2 Theoretical | | anhydrous ammonia, | audio | exams, |
| | 3 Practical | types of nitrogen | ammonium nitrate, | | assigned |
| | | fertilizers and their | urea, hydrolyzate | Style of writing on the blackboard | assignments |
| | | use as fertilizer. | Urea in the soil and | | and |
| | | Practical: Standard | used as fertilizer. | Direct dialogue style | discussions. |
| | | specifications for | Practical: Introducing | Practical: | |
| | | nitrogen fertilizers, | the student to how to | Assigning tasks and | |
| | | methods of using | detect nitrogen | reporting | |
| | | these fertilizers | fertilizers, and | | |
| | | , A3 | methods of | | |
| | | 70000 | manufacturing these | | |
| | 1 | الكيف المعتقل | fertilizers | | |
| | 4. | Theoretical: The | Guidance and | Theoretical: | Short |
| 15 | 2 Theoretical | student will become | associated | Methods | exams, |
| | 3 Practical | familiar with the most | environmental | audio | assigned |
| | \ | important electronic | problems | Style of writing on | assignments |
| | \ | instructions and | Using fertilizers, | the blackboard | and |
| | 1 | problems and the | optimal use | Direct dialogue style | discussions. |

| | | optimal use of because of the name technique. Practical: Methodealing with fertilizers, and head these fertilities the soil | ods of now to zers to | Practical: the studer important used in us fertilizers use them | ies in Iraqi e. Introducing at to the most guidelines sing and how to | Ass | Practical: igning tasks and reporting | |
|--|---|--|---|--|---|-------|---|--|
| T | Calendar | methods | and the same of | Course E | Class | | Relative weight | |
| 1 | Carcildar | methods | | veek) | Citass | | % | |
| 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 practical | - 1 | 6% | |
| 3 | Midterm Exam pract | The second secon | week (9) | | 10 theoretical + 5 practical | | 15% | |
| 4 | Short test | t Quiz(2) | week (12) | | 4 theoretical practical | _ | 6% | |
| 5 | Final prac | | Practical exams week | | 20 | | 20% | |
| 6 | Final theor | theo | week of oretical xams | 40 | | 40% | | |
| | . Learning and T | | | | Fertilizer te | chnol | ogies book. | |
| Required textbooks (curricular books, if any) Main references (sources) | | | | Lectures prepared from the Internet. Fertilizer technologies by Dr. Nour El-Din Shawky Ali 2007. | | | | |
| Recommended books and references (scientific journals, reports) | | | | Fertilizers and soil fertility. Written by Dr. Saadallah Najm Abdullah Al-Naimi 1999. College of Agriculture | | | | |
| المحلية الموادة المواد | | | | / University 2. Fertilizati Kazem Masi Awad 1987. of Basra. | / University of Mosul. 2. Fertilization and soil fertility. Written by Dr. Kazem Mashhout Awad 1987. College of Agriculture / Universit of Basra. | | tten by Dr. | |
| Elect | tronic References | , Websites | 100 | | FAO | | | |

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Theoretical subject teacher: Dr. Rana Saadallah Aziz

practical subject teacher.

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Chairman of the Scientific Committee: Dr. Abdul Qader Abash Sabak Head of the Department of Soil Sciences: Dr. Khaled Anwer Khaled