Course Description Form Fertilizer technologies

1. Course Name:
Fertilizer technologies
2. Course Code:
FERT414
3. Semester / Year:
Second Semester/ 2024-2025
4. Description Preparation Date:
15/01/2025
5. Available Attendance Forms:
Full time (theoretical lecture and practical lecture) weekly
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours (2 hours theoretical and 3 hours practical per week) for 14 weeks, number of units 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Basem R.Bader Email: basemrbader@uodiyala.edu.iq
8. Course Objective

Course Objectives	The aim is to introduce students to the principles and techniques used in manufacturing and preparing fertilizers, methods of expressing them, and how to calculate the percentages added to the soil

9. Teaching and Learning Strategies

Strategy	In-person lectures for 15 weeks, including two monthly exams and daily exams.

10. Course Structure
The theoretical part

Week	Hours	Required Learning Outcome	Unite or Subject Name	Learning Method	Evaluation Method
1	2	Fertilizers, their types and classification	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
2	2	Nitrogen fertilizers	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
3	2	Phosphate fertilizers.	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
4	2	Fertilizers containing potassium	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
5	2	Sulfur, calcium and magnesium fertilizers	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
6	2	Micronutrient fertilizers	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
7	2	Micronutrient fertilizers	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
8	2	Biol Nutrients, water use and other interactions	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
9	2	Fertilizer evaluation and mixing	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
10	2	Nutrient management basics	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily

					reports
11	2	Economics of using fertilizers	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
12	2	Environmental problems associated with the use of fertilizers	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
13	2	Optimal use of chemical fertilizer technologies in Iraqi agriculture	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
14	2	Semester second examFertilizer analysis	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
15	2	Agricultural challenges and opportunities Terms and concepts related to fertilizers and their interactions with soil	Fertilizer technologies	Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports

Practical part					
Week	**Hours**	**Required Learning Outcome**	**Unite or Subject Name**	**Learning Method**	**Evaluation Method**
1	3	Fertilizer technologies Fertilisers Some chemical principles associated with fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
2	3	Nitrogen Simple nitrogen fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
3	3	Phosphorus Phosphate fertilizers Simple mineral phosphate fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
4	3	Potassium Potasl	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and

		fertilizers The most important potassium fertilizers used to fertilize agricultural lands Sulfur Sulfur fertilizers			final exams and daily reports
5	3	Micronutrient fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
6	3	Iron fertilizer Fe Manganese Fertilizers Mn	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
7	3	Zinc fertilizers Zn	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
8	3		Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
9	3	boron fertilizers Copper Fertilizers Cu Alamybdenum Fertilizers Mo	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
10	3	Compound or mixture fertilizers Advantages of compound fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
11	3	Terminology related to compound and mixed fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
12	3	Organic fertilizer Sources of organic fertilizers Conditions and specifications of good organic fertilizer	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports

13	3	Calculations of the amount of added fertilizers	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
14	3	Methods of adding solid fertilizersl	Fertilizer technologies	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports

11. Course Evaluation

Exams
Daily exams and discussion questions within the lecture
The degree of participation in questions related to the academic subject

12. Learning and Teaching Resources

Required Textbook (curricular books, if any)	Ali, Nour al-Din Shawqi, 2010, Fertilizer Technologies and Their Uses, College of Agriculture, University of Baghdad. (under publication)
Mean references (sources)	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…)	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.
Electronic references, Websites	Awad, Kazem Mashhout, 1984. Practical tests of fertilizers and soil fertility. Albasrah university