Course Description Form

1. Course Name:

Plant nutrition

2. Course Code:

PLNU214

3. Semester / Year:

Second semester –2024-2025

4. Description Preparation Date:

1\ 2 \ 2025

5. Available Attendance Forms:

Compulsory + electronic

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

75hours / 3.5 units

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

Name: Assist. Pro. Fatih Abid Hassan

Name: Assist. Lecturer. Hesham Saad aldeen Younis

8. Course Objectives

-Preparing students with the ability to work in the field of plant nutrition and the use of fertilizers according to the modern scientific method to keep pace with the development in this field and entry into the agricultural sector efficiently by participating in agricultural projects .

- Enable the student to diagnose the symptoms of nutrient deficiency on the plant and processed.
- Enable the student to identify the methods of plant sampling, digestion and preparation for chemical analysis.
- Introducing the student to the most important methods of measuring the plant content of elemen
- Introducing the student to the most important methods of preparing nutrient solutions.

9. Teaching and Learning Strategies

- Interactive Lecture
- Brainstorming
- Dialogue and discussion
- Field Training
- Practical exercises
- Field Project
- Self-learning

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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	a2: The student is aware of information about origin and stages of development of plant nutrition	Introduction to the importanc plant nutrition, the origin and development of science	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test

	3 practical	a2:The student gets to know types of laboratory equipment and how it works and h to express the concentration of elements in the plant	Laboratory work guidelines, identification Laboratory equipment .	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Practical short test Quiz (1)
2	2 Theoretical	a2: The student gets to know mineral composition of the plant and the factors affecting it	Essential components of the plant	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test
	3 practical	a2:The student gets to know Conditions for taking the sample fr field, drying and grinding and preparing it for chemical analysis	Plant sampling and preparation for chemical analysis	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Homework
3	2 Theoretical	a2:The student knows the types of nutrient cultures and its importa and advantages and the disadvantages of each type	Plant Growth culture	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Short test
	3 practical	a2:The student learns how to digest a plant sample, ways of digestion and the advantages and t disadvantages of each method	Digestion of plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Homework
4	2 Theoretical	a2:The student gets to know absorbing forms Nutrients and the factors affecting it	Nutrient absorption	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning.	Report 1
	3 practical	b4: The student experiments with preparing an acidic extract of plant samples	Preparation acidic extract of plant sample	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Practical short Quiz (2)
5	2 Theoretical	a2:The student learns about the structure of the root and how to absorb water and the factors affec it	Root, water, absorption and nutrients	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Report 2
	3 practical	b4: The student experiments with estimating root exchange capacity	Root Cation Exchange capacity	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
6	2 Theoretical	a2:The student gets to know absorption theories Negative and active	Nutrient absorption theories - theories of negative and active absorption	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Semester test 1
	3 practical	b4: The student experiments with making nutrient solutions of three or four salts	Preparation of nutrient solutions	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
7	2 Theoretical	a2: The student gets to know the importance of nitrogen, the way it is absorbed and its transformatio within the plant , the symptoms of deficiency and methods addressed	Nitrogen in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Report 3
	3 practical	b4: The student experiences the stages of nitrogen determination using the Kjeldahl method and how calculate concentration in plant	Determination of Total Nitrogen in Plant Samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework

8	2 Theoretical	a2:The student gets to know the importance of phosphorus , the way it is absorbed , its transformations within the plant and the symptoms of its deficiency	phosphorus in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Short test Quiz (1)
	3 practical	b4: The student experiences the estimation of phosphorus using the colorimetric method and how to calculate the concentration in different units	Determination of phosphorus in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
9	2 Theoretical	a2: The student gets to know the importance of Potassium and the way it is absorbed , the symptoms its deficiency , methods Processed and the most important Potassium fertilizers	Potassium in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Short test
	3 practical	b4:The student can estimate Potassium using a flame device and how to calculate the concentration In different units	Determination of potassium in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
10	2 Theoretical	a2:The student can recognize on the importance of calcium , the way it is absorbed , its transformations within the plant and the symptoms of its deficiency and methods addressed	Calcium in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homewor
	3 practical	b4:The student can estimate calcium using chelating substances and how to calculate the concentration In different units	Determination of calcium in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
11	2 Theoretical	a2:The student can recognize on the importance of magnesium, the way it is absorbed , its transformations within the plant , t symptoms of its deficiency	Magnesium in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Semester Exam2
	3 practical	b4:The student can estimate magnesium using chelating substances	Determination of magnesium in plants	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
12	2 Theoretical	a2:The student gets to know the importance of sulfur , the way it is absorbed , its transformations and symptoms of its deficiency	Sulfur in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Short test
	3 practical	b4:The student can estimate Sulfur using turbidity method	Determination of sulfur in plant samples	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
13	2 Theoretical	a2: The student can recognize on the importance of both Iron and zinc , method absorption, transformation within plant and symptoms of deficiency	iron and zinc in plant	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Report 4

	3 practical	b4:The student can estimate iron by the color method	Determination of iron in plant by the chromatography method	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Homework
14	2 Theoretical	a2:The student can recognize on the importance of both manganese ,copper, method Absorption and transformation and symptoms of deficiency	manganese and copper in plant	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test Quiz (2)
	3 practical	b4:The student can estimate micro element cations	Determination of iron, zinc, manganese and copper in Plant using atomic absorber	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Practical short Quiz (3)
15	2 Theoretical	a2:The student gets to know the importance of boron molybdeum ,absorption transformation within the plant ,Symptoms of deficiency	Boron and molybdeum in Plant	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test Quiz (3)
	3 practical	b4:The student can estimate Boron and molybdeum	Determination of boron and molybdium in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Homework

11. Course Evaluation

	Evaluation	Time of evalution	Degree	Relative weight
1	Report 1	Fourth week	2.5	2.5
2	Report 2	Fifth week	2.5	2.5
3	Quiz (1)	eighth week	2	2
4	Quiz (2)	Fourteenth week	2	2
5	Quiz (3)	Fifteenth week	1	1
6	Semester Exam (1)	Sixth week	7.5	7.5
7	Semester Exam (2)	eleventh week	7.5	7.5
8	Report3	seventh week	5	5
9	Report4	thirteenth week	2	2
10	Practical Quiz (1)	First week	1	1
11	Practical Quiz (2) Quiz	Fourth week	0.5	0.5
12	Practical Quiz (3) Quiz	Fourteenth week	1	1
13	Homework	Weeks 13،12،11،10،9،8،7،6،5،3،15،	5.5	5.5
14	Final theoretical test	Final Semester Exams	40	40
15	Final Practical Test	Final Semester Exams	20	20
Sum	Total	100	100 %	%100

1. Learning and Teaching Resources	
Plant Nutrition - Menkel and Kirby - translated by Dr. Saad Allah Al-Nuaimi	Required textbooks (methodology, if any)
Fertilizers and soil fertility Dr. Saad Allah Al-Nuaimi	Main references (sources)
Soil fertility and fertilization-Dr.Kazem Mashhoot awad Plant physiology . Dr. Abdul azim Kazem	Recommended books and references (scientific journals, reports...)
	Electronic References, Websites

Mr. Fatih Abid Hassan
Theoretical subject lecturer

Mr. Hesham Saad aldeen Younis
Practical subject lecturer

Dr. Haitham Mohialdin Mhammed
Chairman of the Scientific Committee

Dr. Firas Kazem Al-Jubouri
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