



Course Description Form

1. Course Name: Plant physiology
2. Course Code: PLPH210
3. Semester / Year: 2023-2024
4. Description Preparation Date: 2024 /2/1
5. Available Attendance Forms: in person
6. Number of Credit Hours 2 theoretical + 3 practical (5) / Number of Units (3.5)
7. Course administrator's name (mention all, if more than one name) Name: Professor Fathel Fathe Rajab Assistant teacher, Elaf Taha Hussein Email: fathelffr@uomosul.edu.iq eelaf.taha@uomosul.edu.iq
8. Course Objectives Enabling the student to understand and comprehend what is related to plant physiology and its relationship to other sciences Enabling the student to know the most important scientific methods in learning about plant physiology Enabling the student to become familiar with the concept of plant physiology Enabling the student to be able to investigate plant cells and all phenomena related to plant physiology • The student can explain all aspects of plant life through plant physiology
9. Teaching and Learning Strategies - Interactive lecture

- Brainstorming
- Dialogue and discussion
- Field Training
- Practical exercises
- Field project
- Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	A1: Learn about the concept of plant physiology B1: He possesses the practical and mental knowledge and concepts that help him in studying plant physiology D3: Community members participate and work to educate them about the importance of plant physiology and its impact on controlling pollution. E1: It contributes to enhancing the values of science among community members and making them aware of the importance of plant physiology and increasing green spaces to improve the environment and serve society.	Introduction to plant physiology	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C3: He uses the information he needs and what is available to him to master his work	Microscope installation	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
2	2 Theoretical	A2: Defines water absorption systems and their importance and environmental aspects B1: He possesses practical and mental knowledge and concepts that help him know the relationship of plants to water C5: Successfully balances the investment, use and employment of plants in accordance with their relationship with water	Plant relationship with water	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C3: He uses the information he needs and what is available to him to master his work	Studying the plant cell and its characteristics,	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test

			preparing slides, and revealing the cell components through practical experiments through the microscope		
3	2 Theoretical	A2: Determines the rising sap systems in the plant	Xylem sap	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C3: He uses the information he needs and what is available to him to master his work C4: Prepare solutions of different percentages, molarity, molarity, and standard D1: Acquiring the skills of preparing various solutions to treat plants with	Scientific experiments on methods of expressing the concentrations of solutions	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
4	2 Theoretical	A2: Determines the systems of water rising to the top of the plant C4: Recognizes the anatomical structure of the bark D3: Recognizes the elements of the cortex E1: Contributes to the recognition of phloem transport	Phloem sap	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C3: He uses the information he needs and what is available to him to master his work C4: Identify and prepare true solutions, colloidal and emulsion C5: Distinguish between true, colloidal and emulsion solutions	Scientific experiments to prepare real and colloidal solutions, emulsions and colloids	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
5	2 Theoretical	C4: Draws up plans and programs for development in the field of plant transpiration D3: Community members participate and work to educate them about the importance of transpiration in plants and its impact on controlling irrigation. E1: Dissects the stomatal system	Transpiration in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C3: He uses the information he	Scientific	Interactive lecture,	semester test 1,

		needs and what is available to him to master his work C4: Explains the Tyndale phenomenon D1: Acquire skills in stabilizing colloids through scientific experiments	c experim ents on the physiolo gical propertie s of the Tandall phenome non	brainstorming, dialogue and discussion, self- learning,	final test
6	2 Theoretical	A2: Determines the types of mineral nutrition in plants C4: Draws up plans and programs for development in the field of plant nutrition D1: Acquiring the communication skills necessary to deal with confidence and certainty at the individual and group levels D3: Community members participate and work to educate them about the importance of plant nutrition and its role in regulating growth E1: Contributes to identifying vitamins necessary for growth and development	Mineral nutrition in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C2: Conduct diffusion experiments C3: He uses the information he needs and what is available to him to master his work C4: Draws plans and programs for development in the field of the diffusion process of nutrients in plants C5: Successfully balances the amount of nutrients needed by the plant	Scientific experiments on the phenomenon of diffusion	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
7	2 Theoretical	A3: He knows the enzyme and what it is composed of C4: splitting enzymes C5: called enzymes	Plant enzymes	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C1: Identify the organs of plant physiology C3: Estimated chlorophyll C4: Determination of nitrogen in plants C5: Successfully balances the investment and use of laboratory equipment and its employment in a way that is compatible with the processes of determining nutrients in plants. D1: Acquiring the communication skills necessary to deal with confidence and certainty at the individual and group levels	Scientific visit to laboratories	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
8	2 Theoretical	A3: Learn about photosynthesis and its effect on plant growth and	Photosynthesis	Interactive lecture, brainstorming,	semester test 1, final test

		development C4: Identify the factors affecting photosynthesis		dialogue and discussion, self-learning,	
	3 Practical	C2: Knows the Plasmolysis and its types C3: He uses the information he needs and what is available to him to master his work C4: Draws up plans and programs for development in the field of reducing Plasmolysis to maintain plant sustainability C5: Invents ways to prevent Plasmolysis in plants	Plasmolysis phenomenon in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
9	2 Theoretical	A4: Learn about the concept of plant respiration C3: He uses the information he needs and what is available to him to master his work	Respiration in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C2: Conducts scientific experiments in osmosis C3: He uses the information he needs and what is available to him to master his work C4: Draws up plans and programs to organize the osmosis process C5: Identify the types of cell membranes in plants	Scientific experiments on osmosis and semi-permeable membranes	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
10	2 Theoretical	A2: Defines different definitions of growth C5: Successfully balances the investment, use and employment of plants to suit growth processes	Growth in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C2: identifies substances that penetrate quickly into the plant and substances that are slow to penetrate C3: He uses the information he needs and what is available to him to master his work C4: Draws plans and programs for development in the field of regulating permeability within plants	Scientific experiments on permeability	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
11	2 Theoretical	A2: Learn about sensation and movement in plants and their importance in plant growth and development C5: Successfully balances the investment and use of movement and sensation in the plant and employs them in accordance with growth processes	Sensation and movement in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C2: Explains the stomatal system C3: He uses the information he needs and what is available to him to master his work C4: Draws plans and programs for development in the field of opening and closing stomata in	The stomatal system	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test

		plants C5: Successfully balances the investment, use and employment of plants in accordance with water absorption processes			
12	2 Theoretical	A2: Learn about Verbalization and its importance in crop flowering C5: Successfully balances the investment and use of plants and their employment in accordance with their Verbalization requirements to increase production	Verbalization	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C2: Learns to measure the speed of transpiration C3: He uses the information he needs and what is available to him to master his work C4: Draws plans and programs on how to reduce plant transpiration C5: Successfully conserves investment in reducing water use	Transpiration measurement	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
13	2 Theoretical	A2: It determines the type of nutrition and nutrients the plant needs for growth and development C3: He uses the information he needs and what is available to him to master his work	Mineral nutrition in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C2: Conducts scientific experiments on the phenomena resulting from radical pressure C3: Uses the information the designer needs and what is available to him to perfect his work C4: Uses special devices to measure dissolved solids in plants C5: Conducting experiments on the force of root pressure	Phenomena resulting from root pressure and measurement of dissolved solids in plants	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
14	2 Theoretical	C3: He uses the information he needs and what is available to him to master his work C5: Successfully balances the investment and use of ornamental plants and uses them to adapt to drought and heat tolerance processes.	Adapt to drought and heat	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C1: Invents new methods for using paper surveying and using modern computers to carry out measurements C3: He uses the information he needs and what is available to him to master his work C4: Draw plans and programs for the estimation of plant dyes C5: Successfully balances increasing the leaf area of the	Measuring plant leaf area and estimating plant pigments (chlorophyll and xanthophyll)	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test

		plant D2: Dealing with modern technology efficiently that enables him to accomplish his scientific and practical tasks			
15	2 Theoretical	C4: Draws up plans and programs for development in the field of adaptation to salinity and light C5: Successfully balance the investment and use of ornamental plants and their adaptations	Adaptation to salinity and light	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test
	3 Practical	C1: Conducts breathing experiments C3: He uses the information he needs and what is available to him to master his work C4: Draws plans and programs for development in the field of regulating plant respiration C5: Differentiate between aerobic and anaerobic respiration D1: Acquiring the communication skills necessary to deal with confidence and certainty at the individual and group levels D2: Dealing with modern technology efficiently that enables him to accomplish his scientific and practical tasks	Measuring plant respiration	Interactive lecture, brainstorming, dialogue and discussion, self-learning,	semester test 1, final test

11. Course Evaluation

seq	Evaluation methods	Evaluation date (week)	Grade	Relative weight %
1	Report 1	fourth week	2.5	2.5
2	Report 2	fifth week	2.5	2.5
3	Short test (1)	sixth week	2	2
4	Quiz Short test (2)	fourteenth week	2	2
5	Quiz Short test (3)	fifteenth week	1	1
6	Semester test (1)	sixth week	7.5	7.5
7	Semester test (2)	eleventh week	7.5	7.5
8	Final theoretical test	Final semester exams	40	40
9	Practical field project	fifteenth week	5	5
10	Field evaluation	third and fifth week	2	2
11	Short test (1)	first week	1	1
12	Quiz Short test (2)	fourth week	0.5	0.5
13	Quiz Short test (3)	fourteenth week	2.5	2.5
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12 and 13	2.5	2.5
15	Final practical test	Final semester exams	2	2
	Total	100	100%	100%

12. Learning and Teaching Resources

Main references (sources)	- Muhammad, A. A. K. 1988. Plant physiology. part One. Dar Al-Kutub for Printing and Publishing - University of Mosul - Republic of Iraq. - Muhammad, A.A. K. 1988. Plant physiology. The second part. Dar Al-Kutub for Printing and Publishing - University of Mosul - Republic of Iraq. - Muhammad, A. A. K. 1988. Plant physiology. the third part. Dar Al-Kutub for Printing and Publishing - University of Mosul - Republic of Iraq.
Plant physiology and development	Plant physiology and development
Electronic References, Websi	https://exa.unne.edu.ar/biologia/fisiologia.vegetal/PlantPhysiologyTaiz2002.pdf



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