

## Course Description Form

1. Course Name:	
Plant Growth Regulators	
2. Course Code:	
PLGR307	
3. Semester / Year:	
Second Semester (Spring) / 2024-2025	
4. Description Preparation Date:	
1/2/2025	
5. Available Attendance Forms:	
Presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical + 3 practical = 5 hours) × 15 weeks = 75 hours / 3.5 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. dr. Omar A. Abdulqader Email: <a href="mailto:edu3ab@uomosul.edu.iq">edu3ab@uomosul.edu.iq</a> Name: Assist. Lect. Khalil Ibrahim Khalil Email: <a href="mailto:khaleelibk@uomosul.edu.iq">khaleelibk@uomosul.edu.iq</a>	
8. Course Objectives	
<b>Theoretical:</b> <ul style="list-style-type: none"> <li>- Introducing the student to agricultural growth regulators and the role of growth hormones in plant life.</li> <li>- Clarifying most of the physiological phenomena controlled by plant hormones such as growth, seed germination, dormancy of buds and seeds, fruit ripening and aging.</li> <li>- Introduce the student to how to use organizations in a correct scientific way and their interactions with each other.</li> <li>- Introducing the student to how to use growth organizations and obstacles in the practical aspect for the purpose of increasing the yield.</li> </ul>	<b>Practical:</b> <ul style="list-style-type: none"> <li>- The student acquires the skill of preparing solutions from growth regulators in addressing negative physiological phenomena and improving positive phenomena for the purpose of increasing production.</li> <li>- Conducting scientific experiments to see the effect of growth regulators.</li> <li>- Detection and appreciation of phytohormones and growth regulators.</li> </ul>

<ul style="list-style-type: none"> <li>- Introducing the student to how to address some of the phenomena that accompany plant growth</li> </ul>	
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## 9. Teaching and Learning Strategies

### Theoretical:

- Interactive Lecture
- Brainstorming
- Dialogue and discussion
- Assignment and report
- Presentations of models of the effects of growth regulators on agricultural crops.
- It is tasked with preparing a report on one of the topics of growth organizations and discussing it in it.
- Scientific visits.

### Practical:

- Commissioning teamwork to reveal leadership skills.
- Assigning tasks and a report for each experiment.

## 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical 3Practical	<b>Theoretical(a1,c1):</b> The student learns about the types of growth regulators and plant hormones, how to apply growth regulators in increasing the yield <b>Practical(b1):</b> examines and distinguishes the types of diffusers solutions	<b>Theoretical:</b> Introduction to Hormones and Growth Regulators <b>Practical:</b> Learn about the shapes of growth regulators	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
2	2Theoretical 3Practical	<b>Theoretical(a2,c2):</b> The student is introduced to Auxin, Measures and adjusts the concentration of solutions to suit the needs of plants <b>Practical(c7):</b> determines the concentration and type of diffuser solutions	<b>Theoretical:</b> Auxin: discovery, existence, Transmission in the plant <b>Practical:</b> How to prepare Auxin	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
3	2Theoretical 3Practical	<b>Theoretical(a3):</b> Knows what measures of biological responses are <b>Practical(b2):</b> Reveals using a regulated concentration using standard solutions	<b>Theoretical:</b> The mechanism of action of Auxin and their physiological effects <b>Practical:</b> Auxin Experiments	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions



4	2Theoretical 3Practical	<p><b><u>Theoretical(a4):</u></b> Through the degree of response, the student identifies the internal content of auxins</p> <p><b><u>Practical(b3):</u></b> Measures growth, rates and its impact on Auxin, GA and CK</p>	<p><b>Theoretical:</b> gibberellins, their discovery, presence and transmission in plants</p> <p><b>Practical:</b> how to prepare gibberellins</p>	<p><b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style, scientific visit</p> <p><b>Practical:</b> assignment and report</p>	Quizzes, assignments, discussions
5	2Theoretical 3Practical	<p><b><u>Theoretical(a5):</u></b> The student learns about the nature of growth in plants, including the balance of hormones that stimulate and inhibit growth</p> <p><b><u>Practical(b4):</u></b> Reveals the physiological effects of gibberellins by experiment</p>	<p><b>Theoretical:</b> Gibberellins</p> <p><b>Practical:</b> Gibberellins Experiments</p>	<p><b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style</p> <p><b>Practical:</b> assignment and report</p>	Quizzes, assignments, discussions
6	2Theoretical 3Practical	<p><b><u>Theoretical(a6,c3):</u></b> Identify the importance of CK in the reproductive tissues of plants, determine the pathways of biosynthesis of CK, identify and treat the causes of leaf and fruit loss</p> <p><b><u>Practical(b5):</u></b> distinguish between the effect of both CK and GA</p>	<p><b>Theoretical:</b> Cytokinins: Definition and Location, Biostructure, Biosynthesis</p> <p><b>Practical:</b> How to prepare Cytokinins</p>	<p><b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style</p> <p><b>Practical:</b> assignment and report</p>	Quizzes, assignments, discussions
7	2Theoretical 3Practical	<p><b><u>Theoretical(a7,c4):</u></b> The student learns about the mechanism of action of the CK, determining and modifying the shelf life of the leaves, predicting the date of flowering and maturity</p> <p><b><u>Practical(b6):</u></b> Reveals the mechanism of action of cytokinins and their physiological effects through an experiment</p>	<p><b>Theoretical:</b> Cytokinins: mechanism of action, physiological effects, Cytokinins and Senescence</p> <p><b>Practical:</b> Cytokinins Experiments</p>	<p><b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style</p> <p><b>Practical:</b> assignment and report</p>	Quizzes, assignments, discussions
8	2Theoretical 3Practical	<p><b><u>Theoretical(a8,c5):</u></b> Illustrates the method of ethylene transmission, determining the ripening period</p> <p><b><u>Practical(b7):</u></b> Tests the effect of ethylene on broad, thin-leaved plants</p>	<p><b>Theoretical:</b> Ethylene Motion and Transmission</p> <p><b>Practical:</b> Ethylene Preparation Method</p>	<p><b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style, scientific visit</p> <p><b>Practical:</b> assignment and report</p>	Quizzes, assignments, discussions
9	2Theoretical 3Practical	<p><b><u>Theoretical(a9):</u></b> ethylene and Obsolete Senescence and Maturation Events in Plants</p>	<p><b>Theoretical:</b> Ethylene: mechanism of action, physiological effects, economic importance of ethylene</p>	<p><b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style</p>	Quizzes, assignments, discussions

		<b>Practical(b8):</b> He conducts experiments on plants demonstrating the physiological effects of ethylene	<b>Practical:</b> Ethylene Experiments	<b>Practical:</b> assignment and report	
10	2Theoretical 3Practical	<b>Theoretical(a10,c6):</b> Identify the mechanism of effect of ABA in stomata and plant dyes, Explains the reasons for the low efficiency of water consumption <b>Practical(b9):</b> examines the effects of paper treatment with ABA	<b>Theoretical:</b> Growth Inhibitors ( ABAs) <b>Practical:</b> Preparation method (ABA)	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
11	2Theoretical 3Practical	<b>Theoretical(a11):</b> Recognizes the cons of high ABA <b>Practical(e1):</b> Determines the preference of treatment with ABA and salicylic in stimulating plants to resist drought and salinity	<b>Theoretical:</b> Physiological Effects of ABA <b>Practical:</b> ABA Experiments	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
12	2Theoretical 3Practical	<b>Theoretical(a12):</b> Shows the impact of good and bad obstacles <b>Practical(b10):</b> Measures growth inhibitors	<b>Theoretical:</b> growth inhibitor and their agricultural importance. <b>Practical:</b> Experiences of Growth inhibitor	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
13	2Theoretical 3Practical	<b>Theoretical(a13):</b> A scientific debate justifies and governs the use of growth regulators in modern technologies <b>Practical(c2):</b> the properties of growth regulators decide how to use them in tissue culture	<b>Theoretical:</b> the use of growth regulators in modern technologies <b>Practical:</b> Tissue Culture Experiments	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
14	2Theoretical 3Practical	<b>Theoretical(a14):</b> Identifying the positive and negative role of growth regulators in bringing about genetic mutations <b>Practical(c8):</b> Identifies growth regulators that create the effect of genetic mutations	<b>Theoretical:</b> the use of growth regulators in modern technologies <b>Practical:</b> Experiments with Genetic Mutations	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions
15	2Theoretical 3Practical	<b>Theoretical(a15):</b> Explains the types and roles of growth regulators that are related to seed dormancy and germination <b>Practical(b11):</b> characterizes the effect	<b>Theoretical:</b> The Role of Growth Regulators in Dormancy and Post-Harvest <b>Practical:</b> Breaking seed dormancy Experiments	<b>Theoretical:</b> auditory styles, blackboard writing style, direct dialogue style <b>Practical:</b> assignment and report	Quizzes, assignments, discussions



		of growth regulators in post-harvest dormancy			
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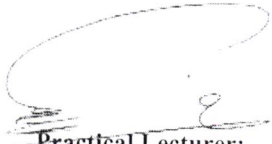
## 11. Course Evaluation

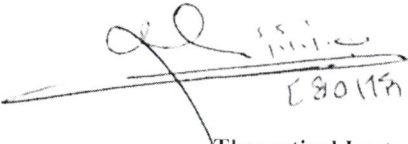
No.	Evaluation methods	Calendar date (week)	Grade	Relative weight %
1	Report 1	Fourth week	2.5	2.5
2	Report 2	Fifth week	2.5	2.5
3	Quiz (1)	Sixth week	2	2
4	Quiz (2)	Fourteenth week	2	2
5	Quiz (3)	Fifteenth week	1	1
6	Semester Exam (1)	Sixth week	7.5	7.5
7	Semester Exam (2)	The first week is difficult	7.5	7.5
8	Final theoretical test	Final Semester Exams	40	40
9	Practical field project	Fifteenth week	5	5
10	Field Assessment	Third and fifth week	2	2
11	Practical Quiz (1)	First week	1	1
12	Practical Quiz (2) Quiz	Fourth week	0.5	0.5
13	Practical Quiz (3) Quiz	Fourteenth week	1	1
14	Homework and discussions	All weeks	5.5	5.5
15	Final Practical Test	Final Semester Exams	20	20
	Total	100	100%	100%


## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the subject teacher
Main references (sources)	<p><b>Rademacher, W. (2015).</b> Plant growth regulators: backgrounds and uses in plant production. <i>Journal of plant growth regulation</i>, 34, 845-872.</p> <p><b>Davies, P. J. (Ed.). (2012).</b> Plant hormones and their role in plant growth and development. Springer Science &amp; Business Media.</p>

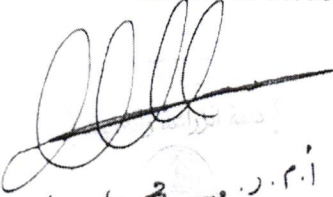
Recommended books and references (scientific journals, reports...)	<p><b>Srivastava, L. M. (2002).</b> Plant growth and development: hormones and environment. Elsevier.</p> <p><b>Plant hormones articles from across Nature Portfolio</b></p> <p><a href="https://www.nature.com/subjects/plant-hormones">https://www.nature.com/subjects/plant-hormones</a></p>
Electronic Websites	<p><a href="https://byjus.com/neet/plant-hormones/">https://byjus.com/neet/plant-hormones/</a></p> <p><a href="https://www.sciencedirect.com/topics/neuroscience/plant-hormone">https://www.sciencedirect.com/topics/neuroscience/plant-hormone</a></p> <p><a href="https://organismalbio.biosci.gatech.edu/chemical-and-electrical-signals/plant-hormones-and-sensory-systems/">https://organismalbio.biosci.gatech.edu/chemical-and-electrical-signals/plant-hormones-and-sensory-systems/</a></p>

  
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