

1. Course name:					
Biological Control					
1. Course code:					
BICO421					
1. Semester/Year: Annual					
First semester/2024-2025					
1. The date this description was prepared					
1 / 2 / 2025					
1. Available attendance forms:					
Classroom					
1. Number of study hours (total)/number of units (total):					
75 hours / 3.5 units					
1. Name of the course administrator (if more than one name is mentioned)					
Dr. Khalid Omairy Mohammed khalidomairy73@uomosul.edu.iq Ahmed Thamer Hemmadi					
1. objectives Course					
<ul style="list-style-type: none"> • Preparing students who have the ability to work in the field of crop protection according to scientific methods • Recent developments related to what is happening in the developed countries of the world in this field • Entering the agricultural sector with distinguished efficiency through participation in government projects • And the labor market • Directing students towards the desire to obtain better experiences when applying for postgraduate studies 					
2. Teaching and learning strateg					
<ul style="list-style-type: none"> - Interactive lecture - Brainstorming - Dialogue and discussion - Field Training - Practical exercises - Field project - Self-education 					
3. Course structure					
the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method

1	٢ theoret ical	a1 : Learn about the concept of biological resistance b1: He possesses practical and mental knowledge and concepts that help him understand the vital enemy c1: Community members participate and work to educate them about the danger of agricultural pests and their impact on agricultural crops	Natural balance, disturbance of the natural balance and its impact on the ecosystem, the impact of the environment on the distribution of insect species, factors that helped in the spread of insects, natural and sexual selection.	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ‘ \ exam final exam
	٣ practic al	b2: Shows the most important methods for identifying biological enemies	Observations that contributed to the initiate and development of the science of biological control. An overview of theory and application.	Interactive lecture, brainstorming, dialogue and discussion, field learning -training, self	Short practical \ test
٢	١ theoret ical	a2: Defines the origins of the concept of biological resistance b1: Possesses practical and intellectual knowledge and concepts that help him understand the hypotheses of evolution	INatural control, biological control to insect pests, the emergence and development of biological resistance, methods used in biological control programs, characteristics that must be present in mature biological enemies, benefits and drawbacks of biological control.	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ‘ \ exam inal examf
	٣ practic al	c1: Uses what is needed to identify the most important insect orders and biological enemies	c1: Uses what is needed to identify the most important insect orders and biological enemies	Interactive lecture, brainstorming, dialogue discussion, field and training, practical -exercises, and self learning	Direct drawing
٣	١ theoret ical	a2: Identifies the most important methods of introducing natural enemies	Methods used to introduce natural enemies, procedures used to introduce natural enemies, final evaluation of natural enemies.	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ‘ \ exam final exam
	٣ practic al	c1: Uses what it needs to identify local biological enemies	Local natural enemies	Interactive lecture, brainstorming, dialogue and discussion, field learning -training, self	Field evaluation
٤	١ theoret ical	a2 : Determines the methods and steps of intrusion c1: Draws the most important morphological forms of parasites	Insects that feed on insects: 1/ Insect parasitoids, forms of parasitism, division of parasitoids	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ‘ \ exam final exam report ‘

			according to the nature of their development on the host, division of parasitoids according to the place where eggs are laid and the individuals live, division of parasitoids according to the stage of the targeted host.		
	۳ practical	c1: Uses what it needs to identify parasitoids	Orders of parasitoids	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Practical ۷ short test direct ۶ drawing
۵	۱ theoretical	b3: Uses the skills necessary to interpret the behavior of parasitoids in reproduction and finding hosts	Methods of parasitoids reproduction, biological characteristics of adult parasitoids, behavior of adults in selecting hosts, method and position of laying eggs by females.	Interactive lecture, brainstorming, dialogue -discussion, self and d learning	Semester ۶ ۷ exam final exam report ۶
	۳ practical	c1: Uses what it needs to identify parasitoids	Orders of Parasitoids	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -self exercises, and learning	Field evaluation
۶	۱ theoretical	a2: Determines the most important strategies of predatory insects c2: Community members participate and work to educate them about the importance of these predators and their impact on the environment	Insects that feed on insects: predators, biological characteristics of adult insect predators, strategies of predatory insects, orders of predatory insects.	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ۱ ۶ exam Short test, al test fin
	۳ practical	c1: Uses what it needs to identify the orders of predatory insects	Orders of predators	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
۷	۱ theoretical	b4: Uses the methods of identifying bacterial resistance to pests	Microbial control of insect pests, characteristics that must be present in a successful pathogen, benefits of microbial control, types of pathogens	Interactive lecture, orming, dialogue brainst -and discussion, self learning	Semester ۶ ۷ exam final exam

	٣ practic al	b4: Analyze the most important symptoms that appear on insect pests c1: Expresses skills through which he is able to distinguish the most important symptoms from other symptoms resulting from other causes.	Symptoms of microbial diseases that appear on insect pests	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project, learning-self	Field project
٨	١ theoret ical	a3: Employs the most important biological and biological relationships between pathogens and insect pests	Classification of pathogenic bacteria of insects, bacterial diseases (milk diseases, diseases caused by crystalline bacteria).	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ١ ٢ exam final exam
	٣ practic al	C1: He uses what he needs to prepare cultures of insects infected with pathogens	Bacteria pathogenic of insects	Interactive lecture brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
٩	١ theoret ical	a4: It uses the main methods to name and classify viruses a2: Identifies the most important organizations interested in nomenclature and classification systems for insect viruses	Families of insect viruses, viral diseases (polyhydrocystis, granulosus, aneutrophils). Classification of insect-pathogenic nematodes and their use in biological control.	Interactive lecture brainstorming, dialogue -and discussion, self learning	Semester ١ ٢ exam final exam
	٣ practic al	c1: Uses what it needs to identify insects infected with viruses	Insect pathogenic viruses	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
١٠	١ theoret ical	a2: Identify the most important local biological enemies in the fields	A scientific trip to some infested fields and orchards with the aim of identifying agricultural pests and their biological enemies.	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Semester ٢ test
	٣ practic al	c1: Uses what it needs to obtain the different phases of local enemies	Ways to collect natural enemies	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
١١	١ theoret ical	a2: Determines the methods used by insects to defend themselves	Defense mechanisms in insects (direct and indirect external defense), cellular internal defense (inflammation, encapsulation, nodule formation, detoxification).	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Final test

	٣ practic al	c1: Uses what it needs to learn about defense mechanisms in insects	Defense mechanisms in insects	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
١٢	١ theoret ical	a2: Determines the systems of parasitoids resistance mechanisms to the host's defense mechanisms	Resistance of parasitoids to host defense methods (protective encapsulation, exhaustion of the host, temporary occupation of some body organs).	Interactive lecture, dialogue -brainstorming -and discussion, self learning	Final test
	٣ practic al	c1: Uses what is needed to identify the mechanisms of parasitoids resistance to host defenses	Mechanisms of parasitoids resistance to host defense methods	Interactive lecture, dialogue -brainstorming and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
١٣	١ theoret ical	a2: Determines the systems of parasitoids resistance mechanisms to the host's defense mechanisms	Resistance of parasitoids to host defense methods (membranous cyst, resistance according to the phase of the attacking host, active resistance to the parasitoids).	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Final test
	٣ practic al	c1: Uses what is needed to identify the mechanisms of parasite resistance to host defenses	Mechanisms of parasitoids resistance to host defense methods	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Direct drawing and homework
١٤	١ theoret ical	a2: Identify the most important methods of other biological resistance	Some other methods of biological control (genetic, pheromones and hormones) The use of insects in biological control of bushes.	lecture, Interactive brainstorming, dialogue -and discussion, self learning	Short test, final test
	٣ practic al	b2: Dealing with modern technology efficiently enables him to learn about other methods of biological resistance	Other biological control methods	Interactive lecture, brainstorming, dialogue and discussion, field training, practical -exercises, and self learning	Short practical test
١٥	١ theoret ical	c1: Put up plans and programs to develop methods for obtaining and using insects in biological control of pushes	Second semester exam The use of insects in biological control of bushes	Interactive lecture, brainstorming, dialogue -and discussion, self learning	Short test, final test
	٣ practic al	c1: Uses the most important biological methods to control the pushes	١ Semester exam Biological control of bushes	Interactive lecture, brainstorming, dialogue and discussion, field	Field project

				training, practical exercises, field project, learning-self	
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4. Course evaluation

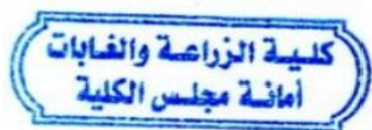
T	Calendar methods	(date (week Calendar	Class	Relative % weight
١	١ Report	fourth week	٢.٥	٢.٥
٢	٢ Report	The fifth week	٢.٥	٢.٥
	(١) Short test Quiz	sixth week	٢	٢
	(٢) Short test Quiz	The fourteenth week	٢	٢
	(٣) Short test Quiz	The fifteenth week	١	١
	(١) Semester test	the sixth week	٧.٥	٧.٥
	(٢) Semester test	The eleventh week is difficult	٧.٥	٧.٥
٨	Final theoretical test	Final semester exams	٤٠	٤٠
٩	Practical field project	The fifteenth week	٥	٥
١٠	Field evaluation	The third and fifth week	٢	٢
	(١) Short practical test Quiz	The first week	١	١
	(٢) Short practical test Quiz	fourth week	٠.٥	٠.٥
	(٣) Short practical test Quiz	The fourteenth week	١	١
١٤	Live drawings and homework	١٣ and ١٢, ١١, ١٠, ٩, ٨, ٦ Weeks	٥.٥	٥.٥
١٥	test Final practical	Final semester exams	٢٠	٢٠
	the total	١٠٠	% ١٠٠	% ١٠٠

5. Learning and teaching resources

(Required textbooks (methodology, if any	Biological control\ Hamza Kazhim Al-zubaidi
(Main references (sources	Predators and Parasitoids\ Opendor Koul
supporting books and Recommended references (scientific journals, (....reports	
Electronic references, Internet sites	


Theoretical subject teacher
Dr. Khalid Omairy Mohammed

Practical subject teacher
Ahmed T. Hemmadi




الدكتور
خالد اوميري المومني
رئيس قسم وقاية النبات




أ.د هادي محمد
رئيس اللجنة العلمية