

MODULE DESCRIPTION

Module Information			
Module Title	Beneficial insects		Module Delivery
Module Type	Core learning activity		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	PE12180		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	AGME1986	College	AGFO1964
Module Leader	Yousif Yakoub Hilal		e-mail yousif.yakoub@uomosul.edu.iq
Module Leader's Acad. Title	assistant professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	2026/2/1	Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	<ol style="list-style-type: none"> 1- Introduce the concept of beneficial insects and their agricultural and environmental importance. 2- Understand honeybee biology, social organization, and economic value. 3- Develop skills in honeybee colony management and seasonal care. 4- Identify honeybee products and apply proper methods for harvesting and utilization. 5- Diagnose honeybee diseases and pests and apply prevention and control methods. 6- Explain the role of honeybees and other insects in pollination and crop yield improvement. 7- Apply methods of honeybee reproduction and queen rearing. 8- Understand silkworm biology, rearing practices, and silk production. 9- Learn principles of biological control using predators and parasitoids. 10- Distinguish beneficial insects from agricultural pests in the field. 11- Build practical skills in field collection, observation, and evaluation. 12- Promote awareness of the role of beneficial insects in ecological balance and sustainable agriculture.
Module Learning Outcomes	<p>LO#1 Understand the scientific and ecological principles of beneficial insects and their roles in agro-ecosystems.</p> <p>LO#2. Know honeybee biology, colony social organization, and roles of colony members.</p> <p>LO#3. Identify honeybee and silkworm diseases and pests, and relevant prevention and control measures.</p> <p>LO#4. Apply skills in apiary management, queen rearing, and natural and artificial reproduction.</p> <p>LO#5. Appreciate the roles of pollinators, predators, parasitoids, and scavenger insects in pollination, biological control, and sustainability.</p>
Indicative Contents	<p>The first four weeks focus on introducing honeybees in terms of their economic and environmental importance, common races, and social organization within the colony. The course then covers honeybee biology, life cycle, external and internal anatomy, and the roles of different colony members. Students learn the principles of establishing and managing an apiary, including essential tools, equipment, and seasonal care, with practical training in hive inspection. In addition, the course addresses honeybee products, their importance, and practical methods for harvesting and utilization. [SSWL=15 hrs].</p> <p>Weeks five to eight cover honeybee diseases and pests, including their identification, diagnosis, and methods of prevention and control. The course highlights the role of honeybees in pollination and their importance in increasing agricultural productivity,</p>

	<p>with field visits to observe pollinators. It also addresses natural and artificial methods of honeybee reproduction, such as swarming and colony division. In addition, students learn the principles and practical steps of queen rearing and artificial insemination through applied training. [SSWL=15 hrs] .</p> <p>Week nine focuses on introducing the silkworm and its economic importance. It covers the silkworm life cycle, rearing practices, and feeding methods, with practical training on cocoon identification, silk extraction, and prevention of common diseases.. [SSWL=10 hrs]</p> <p>Weeks ten, eleven, and twelve focus on the concepts and applications of biological control. These weeks cover the role of predatory and parasitic insects in controlling agricultural pests, including their types and mechanisms of predation and parasitism. The content also addresses biological control of weeds using insects, with practical training in field sampling, observation of feeding behavior, and evaluation of field effectiveness. [SSWL=10 hrs]</p> <p>Weeks thirteen and fourteen focus on pollinating insects and decomposer insects and their environmental roles. The content covers the concept of pollination, types of pollinating insects, and their importance in biodiversity and agricultural production, with field observation of pollination behavior. It also introduces scavenger and decomposer insects, their common examples, and their role in organic matter decomposition, soil fertility improvement, and ecological balance, supported by practical sampling and activity assessment. [SSWL=10 hrs]</p> <p>Total hrs = 63 = SSWL - (Exam hrs) = 63 = 63 hr (Time table hrs x 15 weeks)</p>
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Learning and Teaching Strategies

Strategies	<ol style="list-style-type: none"> 1- Interactive lecture 2- Brainstorming 3- Dialogue and discussion 4-Field Training 5- Practical exercises 6- Field project 7- Self-education
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Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4
Total SWL (h/sem)	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2
	Assignments	2	10% (10)	2 and 12	LO #1, #3
	Projects / Lab.	1	10% (10)	Continuous	LO #3, #4 , , #5
	Report	1	10% (10)	13	LO #3, #4 , , #5
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1, #2 , , #3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to honeybees, including their economic and environmental importance, common races, and social organization within the colony.
Week 2	Honeybee biology, including the life cycle, external and internal anatomy, and the functions of workers, the queen, and drones.
Week 3	Honeybee colony management, including apiary establishment, tools and equipment, and seasonal feeding and care.
Week 4	Honeybee products, including honey, beeswax, royal jelly, pollen, propolis, and bee venom.
Week 5	Honeybee diseases and pests, including bacterial, fungal, and viral diseases, insect and non-insect pests, and methods of prevention and control.
Week 6	The role of honeybees in pollination, their importance in increasing agricultural productivity, and the management of honeybee colonies for pollination purposes.

Week 7	Methods of honeybee reproduction, including natural reproduction, swarming and its types, and artificial colony division.
Week 8	.Queen rearing and artificial insemination in honeybees
Week 9	Silkworms: introduction and economic importance, life cycle, rearing practices, silk production, and common diseases with methods of prevention.
Week 10	Predators: the concept of biological control, types of predatory insects, mechanisms of predation, use of predators in controlling agricultural pests, and applied examples from agricultural fields.
Week 11	Parasitoids: the concept of biological control, types of parasitic insects, mechanisms of parasitism, use of parasitoids in controlling agricultural pests, and applied examples from agricultural fields.
Week 12	Biological control of weeds, including weed-feeding insects, their types, and their importance.
Week 13	Pollinating insects: the concept of pollination, types of pollinating insects, their role in biodiversity, their impact on agricultural crops, and methods for their conservation.
Week 14	Scavenger and decomposer insects: definition, common examples, their role in organic matter decomposition, and their importance in soil fertility.
Week 15	General review and monthly examination.
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	Apiary visit to identify honeybee colonies and races.
Week 2	Laboratory dissection of honeybee colony members and identification of the main internal organs and structures.
Week 3	Identification of essential tools and equipment used in beekeeping and honeybee colony inspection.
Week 4	Practical application of methods for collecting honeybee products.
Week 5	Diagnosis of diseases and pests affecting honeybees.
Week 6	Apiary visit and identification of different types of pollinating insects.
Week 7	Methods of handling, hiving swarms, and artificial colony division.

Week 8	Practical application of queen rearing and artificial insemination methods.
Week 9	Silkworm stages, feeding and rearing practices, identification of cocoons, and silk extraction.
Week 10	Collection of predatory insects and their identification in comparison with agricultural pests.
Week 11	Parasitic insects, observation of parasitism, and applications of biological control.
Week 12	Field sample collection, observation of feeding behavior, and evaluation of field activity.
Week 13	Collection of pollinating insects, observation of pollination behavior, and evaluation of their field activity.
Week 14	Collection of scavenger insects, study of their role in decomposition, and their relationship to soil fertility.
Week 15	General review, final practical examination, and submission of reports.

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Beekeeping and Silkworms Book / Written by Dr. Louay Karim Al-Naji	
Recommended Texts	The bees of the world /Charles D. Michener	
Websites	https://www.google.com/search?q=%D9%83%D8%AA%D8%A8+%D8%AA%D8%B1%D8%A8%D9%8A%D8%A9+%D8%A7%D9%84%D9%86%D8%AD%D9%84&oq=%D9%83%D8%AA%D8%A8+%D8%AA%D8%B1%D8%A8%D9%8A%D8%A9+%D8%A7%D9%84%D9%86%D8%AD%D9%84&aqs=chrome..69i57j0i22i30l2j0i15i22i30l2.6551j0j15&sourceid=chrome&ie=UTF-8	

Grading Scheme

Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	(45-49)	More work required but credit awarded
	F – Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



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