Basic Information

Course Code

Course Title Applied Entomology and Acarology

Academic Year 2022/2023

Academic Program New Professional Diploma in Plant Clinic and Phytosanitary

Technologies

Hours/week Lectures: 2 Practical: 2 total: 3

semester

Course Description: This course introduces students to the major orders of insects and other arthropods of economic importance with specific emphasis on the major harmful insect and mite pests of the important agricultural and horticultural crops in Egypt. Summary is given on the various orders of insects, life cycles and symptom of infestation caused by major groups of these pests; principles for control techniques and pest management will be included.

1. Course Aims

- 1.1- Know the economic importance of arthropod pests on crop production
- 1.2- Recognize the major morphological features of insect and mite pests
- 1.3- Define the different species of plant-damaging insects and mites
- 1.4- Recognize the biology and metmorphosis of different insects and mites
- 1.5- Describe the type of damage caused by plant-damaging insects and mites
- 1.6- Detect the infestation of insects and mites on different crops in Egypt
- 1.7- Manage the orchards or field against these pests before their outbreaks
- 1.8- Review different approaches to control and minimize their impact on yield
- 1.9- Determine the basic principles of Integrated Pest Management (IPM)

2. Intended Learning Outcomes

2.1. Knowledge and Understanding

On successful completion of this course, the student should be able to

- 2.1.1- Mention the different species of insects and mites and their host plants
- 2.1.2- Understand the development and life cycle of insects and mite pests
- 2.1.3- Know the behavior and feeding habits of these pests
- 2.1.4- Recognize the damage types caused by these pests on different crops
- 2.1.5- Lists the different methods used to manage these pests

2.2. Intellectual Skills

By the end of this course, the student should be able to

- 2.2.1- Conclude the factors affecting the population status of insect and mite pests
- 2.2.2- Evaluate the appreciate conditions for the factors causing infestation with different insect and mites on agricultural crops
- 2.2.3- Employs the information on life cycles of these pests in how to combat each species
- 2.2.4- Assess the using of integrated pest control program

2.3. Practical and Professional Skills

By the end of this course, the student should be able to

- 2.3.1- Distinguish between the symptoms of various insect pests and determine the time of their occurrence
- 2.3.2- Determine the seasons of outbreak of pests and how to reduce their damage

- 2.3.3- Utilize standard laboratory procedures and techniques in experimental applications in applied entomology and acarology
- 2.3.4- Plans programs to manage insect and mite pests on agricultural crops

2.4. General and Transferable Skills

By the end of this course, the student should be able to

- 2.4.1- Writes and presents specialized reports to explains different phenomena
- 2.4.2- Think independently, and solve problems on scientific basis
- 2.4.3- Communicates with colleagues and works in a research team
- 2.4.4- Identify roles, tasks, and set clear guidelines and performance indicators
- 2.4.5- Demonstrates self-learning and continuous capabilities to develop professional skills
- 2.4.6- Address the community linked problems with considerable attention to the community ethics and traditions

Course content

Topics	Total (hr)	Lectures (hr)	Practical (hr)
Introduction and overview to the economic importance of arthropods on agricultural crops	3	2	2
General characteristics features and body regions of insects (structure and function)	3	2	2
Mouth parts of insect pests and their role in spreading of plant diseases	3	2	2
Development, metamorphosis, reproduction and main insect orders	3	2	2
Biology, life cycle and feeding habits of main groups of insect pests attacking cereal crops	3	2	2
Biology, life cycle and feeding habits of main groups of insect pests attacking legume crops	3	2	2
Biology, life cycle and feeding habits of main groups of insect pests attacking main vegetable crops	3	2	2
Biology, life cycle and feeding habits of main groups of insect pests attacking some deciduous fruit orchards	3	2	2
Biology, life cycle and feeding habits of main groups of insect pests attacking some evergreen orchards	3	2	2
Biology, life cycle and feeding habits of main groups of insect pests attacking some ornamental plants	3	2	2
General characterstics and classification of phytophagous mites	3	2	2
Biology, life cycle and feeding habits of major plant mite pests	3	2	2
Symptoms and damage of mite pests on main cultivated vegetables, field crops and fruit orchards	3	2	2

Newly approaches to control harmful insects and mites to minimize their impact on crop yield production with emphasis on the basic principles of Integrated Pest Management (IPM)		2	2
Total	42	28	28

Course Matrix for Achievement of Intended Learning Outcomes

		Ho	Ho ur K & U				& U			IS							P & P S							G & T S					
	Topics	S	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	1	2	3	4
	Economic																												
1	importance of arthropods	4																											1
2	Insects morphology (structure and function)	4																											
3	Mouth parts of insect pests	4																											
4	Development, metamorphosi s, reproduction of insects	4																											
5	Insect pests attacking cereal crops	4																											
6	Insect pests attacking legume crops	4																											
7	Insect pests attacking main vegetable crops	4																											
8	Insect pests attacking deciduous fruit orchards	4																											
9	Insect pests attacking evergreen orchards	4																											
1 0	Insect pests attacking ornamental plants	4																											
1	Morphology and classification of phytophagous mites	4																											
1 2	Biology and feeding habits of major plant mite pests	4																											
1 3	Mite pests on main cultivated crops and orchards	4																											

1 4	Newly approaches to Integrated Pest	4														
	Management															

	4. Teaching and Learning Methods								
Lectures: Interactive lectures through: • Teaching lectures to gain knowledge and understanding skil • Seminars • Group discussions									
Practical sessions:	Laboratory lessons (Practical sessions) to gain practical skillsField visits								
Self-Learning activities:	 Assays and reporting in different topics Analyze the results and reach specific conclusion Sample collection, preservation, examination and identification 								

5. Teaching and Learning Methods for Students of Limited Capabilities

- Additional revisions for previously taught and difficult topics
- Providing a summary for previous chapter at the end of each one
- Following up student feedbacks

		6. Student Assessment											
6.1.		Intended Learnin	ng Outcomes Cover	ed									
Metho ds	KU	IS	PPS	GTS									
Writte	2.1.1/2.1.2/2.1.3/2.1.4	2.2.1/2.2.2/2.2.3/											
n	/2.1.5	2.2.4											
exams	72.1.5	2.2.4											
Practic			2.3.1/2.3.2/2.3.3/										
al			2.3.4										
exams			2.3.4										
Oral		2.2.1/2.2.2/2.2.3/		2.4.1/2.4.2/2.4.3/2.4.4/2.4.									
exams		2.2.4		5/2.4.6									
Studen				2.4.1/2.4.2/2.4.3/2.4.4/2.4.									
t				5/2.4.6									
activiti													
es													

 $KU, knowledge \ and \ understanding; IS, intellectual \ skills; PPS, practical \ and \ professional \ skills; GTS, general \ and \ transferable \ skills$

6.2. Exam Description								
Written exams	Short essays							
	• Drawing							
	 Multiple choice questions 							
	• Comparisons							
	 Giving the scientific term/information 							
	 Reasons for what comes 							

Practical exams • Slideshow exams							
	Practical case studies						
	• Exams on plants of the faculty farm						
Oral exams • The exam committee involves at least 3 examiners							
	 Each evaluates the student by giving a separate score 						
	 The scores are then averaged 						
	 The student randomly selects question cards 						
Student activities	Self-learning activities are evaluated throughout the semester						

	6.3. Assessment Schedule	6.4. Weighing of Assessments
Exams and activities	Week (in each semester)	Total (%)
Semester work exam	4th, 8th and 12th	10
Student activities	Throughout the semester	10
Final written exam	15th	50
Final Practical exam	15th	20
Final oral exam	15th	10
Total		100

7. List of References

7.1. Course Notes

Course notes will be given at the beginning of each lecture

7.2. Essential Books

- 1- Chapman, R.F. 1979. The insects: Structure and function. Elsevier Publishing Co., NewYork
- 2- Robert E. Pfadt (1985). Fundamentals of applied entomology (Edn 4). MacMillan Pub Co ISBN
- 3- Fenemore, P. G. (2006). Applied entomology. New Age International.
- 4- D. Dent (2000) Insect Pest Management. Oxford University Press US (CABI Publishing); ISBN.

7.3. Recommended Books

- 1- Wylie, F. R., & Speight, M. R. (2012). Insect pests in tropical forestry. CABI.
- 2- Paull, R. E., & Armstrong, J. W. (1994). Insect pests and fresh horticultural products. Treatments and responses.
- 3- Horowitz, A. R., & Ishaaya, I. (2004). Insect pest management: field and protected crops. Springer Science & Business Media.

7.4. Periodicals, websites, etc.

- Journal of Economic Entomology
- Journal of Applied Entomology
- Journal of Plant Protection Research
- Environmental Entomology

Course coordinator:

Head of Department:

Prof. Dr. Mohamed A. M. Osman

Prof. Dr.

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