

## Basic Information

**Course Code**

**Course Title**

Pesticid action and application techniques

**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 covers the chemical structure and mode of action of the various groups of pesticides that used to protect agricultural crops against pests and diseases. This course covers the use of pesticides, pesticide properties and formulations, methods of application, equipment for application and impact of pesticide on human health and the environment. The main aim of the course is to understand how to safely use and handling of pesticides efficiently with minimal harmful effects to environment and non-target organisms to ensure food safety.

### 1. Course Aims

- 1.1- Recognize the chemistry of different groups of pesticides
- 1.2- Know the mode of action of different pesticides groups
- 1.3- Understand the different metabolites of pesticides
- 1.4- Decide the criteria for selecting pesticides for use in agricultural crops
- 1.5- Learn the factors that influence safe pesticide use and handling
- 1.6- Aware of the adverse effects of pesticides on human health and the environment
- 1.7- Familiar with general hygienic behavior with using pesticides

### 2. Intended Learning Outcomes

#### 2.1. Knowledge and Understanding

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

- 2.1.1- Know the main groups of pesticides and their chemical composition
- 2.1.2- Understand the mode of action, forms and preparations of various pesticides
- 2.1.3- Understand the chemistry and biological activity of main conventional and biopesticides
- 2.1.4- Recognize the different metabolites of pesticides
- 2.1.5- Understand the various toxic and non toxic groups of pesticides
- 2.1.6- Lists the different methods of pesticide application

#### 2.2. Intellectual Skills

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

- 2.2.1- Understand the chemistry and behavior of pesticides
- 2.2.2- Distinguish between the toxicity of various pesticides
- 2.2.3- Recommend the appropriate pesticide for controlling the appropriate pest
- 2.2.4- Evaluate the effective method for pesticide application against the target organism

#### 2.3. Practical and Professional Skills

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

- 2.3.1- Use different types of pesticides, bearing in mind the dangers of each type
- 2.3.2- Deal with more skills with the pesticide identification label and how to use it
- 2.3.3- Use different spraying machines in the application of pesticides
- 2.3.4- Estimates the effectiveness of the pesticide in controlling the target pest

#### 2.4. General and Transferable Skills

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

- 2.4.1- Use modern technology as internet to obtain information about the problem
- 2.4.2- Present specialized report and explain it in front of his colleagues in the classroom



#### 4. Teaching and Learning Methods

Lectures:	Interactive lectures through: <ul style="list-style-type: none"> <li>• Teaching lectures to gain knowledge and understanding skills</li> <li>• Seminars</li> <li>• Group discussions</li> </ul>
Practical sessions:	<ul style="list-style-type: none"> <li>• Laboratory lessons (Practical sessions) to gain practical skills</li> <li>• Field visits</li> </ul>
Self-Learning activities:	<ul style="list-style-type: none"> <li>• Assays and reporting in different topics</li> <li>• Analyze the results and reach specific conclusion</li> <li>• Sample collection, preservation, examination and identification</li> </ul>

#### 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

6.1. Methods	6. Student Assessment			
	Intended Learning Outcomes Covered			
	KU	IS	PPS	GTS
Written exams	2.1.1/2.1.2/2.1.3/2.1.4/2.1.5/2.1.5/2.1.6	2.2.1/2.2.2/2.2.3/2.2.4		
Practical exams			2.3.1/2.3.2/2.3.3/2.3.4	
Oral exams		2.2.1/2.2.2/2.2.3/2.2.4		2.4.1/2.4.2/2.4.3/2.4.4/2.4.5
Student activities				2.4.1/2.4.2/2.4.3/2.4.4/2.4.5

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

#### 6.2. Exam Description

Written exams	<ul style="list-style-type: none"> <li>• Short essays</li> <li>• Drawing</li> <li>• Multiple choice questions</li> <li>• Comparisons</li> <li>• Giving the scientific term/information</li> <li>• Reasons for what comes</li> </ul>
Practical exams	<ul style="list-style-type: none"> <li>• Slideshow exams</li> <li>• Practical case studies</li> <li>• Exams on plants of the faculty farm</li> </ul>
Oral exams	<ul style="list-style-type: none"> <li>• The exam committee involves at least 3 examiners</li> </ul>

- 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	4 <sup>th</sup> , 8 <sup>th</sup> and 12 <sup>th</sup>	10
Student activities	Throughout the semester	10
Final written exam	16 <sup>th</sup>	50
Final Practical exam	16 <sup>th</sup>	20
Final oral exam	16 <sup>th</sup>	10
<b>Total</b>		<b>100</b>

## 7. List of References

### 7.1. Course Notes

Course notes will be given at the beginning of each lecture

### 7.2. Essential Books

- Abu Shabana Mustafa (2005). Pesticides - Part I (in Arabic), 770 pp., Aldar Al-Arabia for Publishing, Egypt
- Abu Shabana Mustafa (2005). Pesticides Part II (in Arabic), 435 pp., Aldar Al-Arabia, Egypt
- Coats, J. R. (2012). Insecticide mode of action. Academic Press.
- Metabolism of pesticides. Menzie, C.M. (1980).
- Al-Sibai, Abdel-Khaleq Hamed. (1966) The chemistry and toxicity of pesticides and their laboratory and field tests: Dar Al-Maaref – Egypt
- In Modern Selective Fungicides. Lyr, H. (1987).
- Pesticides, preparation and mode of action. By R. Cremllyn. Copyright by John Wiley and Sons, Ltd. (1978).

### 7.3. Recommended Books

- Hassall, K.A. 1990. The Biochemistry and uses of pesticides. Structure, metabolism, mode of action and uses in crop production. 2<sup>nd</sup> ed., ELBS/Macmillan Press Ltd. Hampshire, UK
- Stoytcheva, M. (Ed.) (2011). Pesticides in the Modern World: Risks and Benefits. BoD–Books on Demand
- Mathews, G. A. 1985. Pesticide Application Methods. Longman. England.
- Ramulu, U.S.S. 1985. Chemistry of Insecticides and Fungicides, 2<sup>nd</sup> edn. Oxford and IBH Pub. Co., New Delhi. India.
- The Pesticides Book, Ware ,W.G (1994)

### 7.4. Periodicals, websites, ..... etc.

- Journal of Pesticide Science
- Chemosphere

- 
- Pesticides and Health Risks
  - Pesticide Research Journal
- 

**Course coordinator:**

Prof. Dr.

Abu-Shabana Mostafa

**Head of Department:**

Prof. Dr.