

Basic Information

Course Code

Course Title

Field diagnosis of plant disease caused by Viruses

Academic Year

2022/2023

Academic Program

New Professional Diploma in Plant Clinic and Phytosanitary Technologies

Hours/week

Lectures: 1

Practical: 2 total: 2

semester

Course Description: This course introduces students to the field diagnosis of plant viruses. To acquaint the students with basic and applied aspects of virus and plant viruses diseases and those that impact affect the life of plants and the quality and quantity of crops. Important discoveries from viruses that infect various plant families will be included. The course will focus on the classical and modern serological and molecular methods for the plant viruses detection and identification. Modes of transmission, and biological relationships between plant viruses and the insects vectors. A study of the most important viruses that infect vegetable crops, field crops and ornamental plants, explaining the symptoms of infection, methods of transmission, and the most important modern methods in limiting the spread of infection with these viruses.

1. Course Aims

1. To understand the chemical and morphological structure of plant viruses as it relates to their taxonomic position and their ability to cause diseases of plants.
2. To Know the effect of viruses on physiological functions of host plants and their role in etiology of infections.
3. To detect field diagnosis plant nematode symptoms
4. Learn about the methods of collecting plant samples infected with the virus, how to detect the inclusion bodies contained within the infected cells.
5. To learn how to prepare ultra thin sections for examination by the electron microscope.
6. To describe the symptoms of different viral infection on plants.
7. To manage the principles of controlling viruses diseases of plants and Training on the most important preventive measures and modern methods to limit the spread of plant viruses.

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 groups of plant viruses their host plants
- 2.1.2- Understand the plant viruses symptoms
- 2.1.3- Know the study of chemical and morphological structure of plant viruses
- 2.1.4- Recognize the damage types caused by plant viruses on different crops
- 2.1.5- Lists the different methods used to detection and diagnoses of plant viruses

2.2. Intellectual Skills

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

- 2.2.1- Conclude the methods of identify viruses groups affecting plants
- 2.2.2- Evaluate the appreciate methods for detect different plant viruses on agricultural crops
- 2.2.3- Evaluation of the use of an integrated program to reduce the spread of viral diseases

on economic crops

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 plant viral groups .
 - 2.3.2- Determining the percentage of infection and the actual disease severity with viral infections and how to limit its damage
 - 2.3.3- Utilize standard laboratory procedures and techniques in experimental applications in detection and identification of plant viruses
 - 2.3.4- Plans programs to manage viruses on agricultural crops
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2.4. General and Transferable Skills

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

- 2.4.1- Write and present specialized reports to explains different percentage of infection and the actual disease severity
 - 2.4.2- Think independently, and solve problems on scientific basis
 - 2.4.3- Communicate with colleagues and works in a research team
 - 2.4.4- Identify roles, tasks, and set clear guidelines and performance indicators
 - 2.4.5- Demonstrate 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
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Course content

Topics	Total (hr)	Lectures (hr)	Practical (hr)
Introduction in plant viruses	2	1	2
The difference between plant viruses and various other microorganisms.	4	2	4
The characteristics of plant viruses and plant viruses purification	4	2	4
The cultivation of plant viruses and plant virus's morphology	4	2	4
Serological properties and the designation and classification of plant viruses	4	2	4
Types of the plant viruses' groups	4	2	4
Study of the most important viruses that infect different plant crops	2	1	2
Reproduction and infection of plant viruses	2	1	2
The most important preventive measures and modern methods to limit the spread of plant viruses.	2	1	2
Total	28	14	28

4. Teaching and Learning Methods

Lectures:	Interactive lectures through: <ul style="list-style-type: none">• Teaching lectures to gain knowledge and understanding skills• Seminars• Group discussions
Practical sessions:	<ul style="list-style-type: none">• Laboratory lessons (Practical sessions) to gain practical skills• Field visits
Self-Learning	<ul style="list-style-type: none">• Assays and reporting in different topics

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- activities:
- Analyze the results and reach specific conclusion
 - Sample collection, preservation, examination and identification
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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
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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	2.2.1/2.2.2/2.2.3		
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		2.4.1/2.4.2/2.4.3/2.4.4/2.4.5/2.4.6
Student activities				2.4.1/2.4.2/2.4.3/2.4.4/2.4.5/2.4.6

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

6.2. Exam Description

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|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Written exams | <ul style="list-style-type: none"> Short essays Drawing Multiple choice questions Comparisons Giving the scientific term/information Reasons for what comes |
| Practical exams | <ul style="list-style-type: none"> Inclusion bodies slideshow exams Practical case studies Exams on plants of the faculty farm |
| Oral exams | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 th , 8 th and 12 th	10
Student activities	Throughout the semester	10
Final written exam	15 th	50

Final Practical exam	15 th	20
Final oral exam	15 th	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. Agrios, G.N. 2005. Plant Pathology. 5th edition. Academic Press.
2. Bridge, J. and J.L. Starr. 2007. Plant Nematodes of agriculture - John Carter, Venetia Saunders, 2013, Virology: Principles and Applications, 2nd Edition
- 3- Nigel J. Dimmock, Andrew J. Easton, Keith N. Leppard, 2015, Introduction to Modern Virology, 7th Edition.

7.3. Recommended Books

- Principles of virology: molecular biology, pathogenesis, and control, 2000.
- 2- Virology methods manual, 1996.
- 3- Viruses and plant viruses disease, 2002

7.4. Periodicals, websites, etc.

- Journal of plant disease
- Journal of phytopathology
- International Journal of Virology

Course coordinator:

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Head of Department:

Prof. Dr.