

Course Syllabus

1	Course title	Identification of Plant Viral Diseases	
2	Course number	0606724	
3	Credit hours	3	
	Contact hours (theory, practical)	Theory: 2, Practical: 1	
4	Prerequisites/corequisites		
5	Program title	M.Sc. in Plant Protection	
6	Program code		
7	Awarding institution	The University of Jordan	
8	School	School of Agriculture	
9	Department	Department of Plant Protection	
10	Course level		
11	Final qualification	M.Sc. degree	
12	Year of study and semester (s)	2020-2021/ Second Semester	
13	Other department (s) involved in teaching the course		
14	Main teaching language	English	
15	Delivery method	✓ Face to face learning ☐ Blended ☐ Fully online	
16	Online platforms(s)	✓ Moodle ✓ Microsoft Teams ☐ Skype ☐ Zoom	
17	Issuing/Revision Date		

18 Course Coordinator:

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19 Other instructors:

20 Course Description:

As stated in the approved study plan.

This course provides the students with the theoretical and practical information regarding identification methods of plant viruses including the use of electron microscopy, serological and biological techniques. The course will be based on problematic approach that is intended to enhance effective utilization of several techniques to achieve identification of viruses on various crops.

21 Course aims and outcomes:

A- Aims:

At the end of the course, students will become familiar with the most important methods that used for the detection, identification and quantification of plant viruses infecting various crops.

B- Intended Learning Outcomes (ILOs):

Upon successful completion of this course student will be able to:

A. Knowledge and Understanding: Student is expected to

A1- Know what are plant viral diseases and their importance.

A2- Recognize the different methods (biological, morphological characteristics, physical and biochemical techniques, immunoassays and nucleic acid-based techniques) that used for virus detection in plants and environment.

A3- Understand the variations in plant viral pathogens.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1- Diagnose the viral pathogens in plant and environment.

B2- Choose the appropriate method for detection of viral pathogens based on case-to case.

B3- Be able to follow-up well established protocols for viral pathogens detection.

C. Subject- Specific Skills: Students is expected to

C1- Apply the basic knowledge of virus characteristics for identification of plant viral pathogens in the laboratory and in the field.

C2- Integrate different methods and techniques for the best detection and diagnosis of plant viral pathogens in plant and environment.

D. Transferable Key Skills: Students is expected to

D1- Distinguish between different methods that used for detection of plant viral pathogens in plants and environment.

D2- Make the best choice of the diagnostic tests for viral diseases in the field as well as in the laboratory.

PLOs	1	2	3	4	5	6	7	8
SLOs of the course								
A1- Know what are plant viral diseases and their importance.	√							
A2- Recognize the different methods (biological, morphological characteristics, physical and biochemical techniques, immunoassays and nucleic acid-based techniques) that used for virus detection in plants and environment.	√							
A3- Understand the variations in plant viral pathogens.	√							
B1- Diagnose the viral pathogens in plant and environment.		√	√					
B2- Choose the appropriate method for detection of viral		√	√					

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C- Intended Learning Outcomes (PLOS)

After the successful completion of this program student should be able to:

1. Implement the advanced concepts and processes in various disciplines in Plant Protection.
2. Extract information and findings of science from literature in Plant Protection.
3. Plan, conduct and analyze the results of scientific research.
4. Communicate effectively with his supervisors and colleagues orally and in writing.
5. Employ expertise and skills gained in the development production, research, and extension on different levels in the public and private sectors in Jordan and worldwide.
6. Engage efficiently in a scientific team work.
7. Publish research in the field of Plant Protection in peer-reviewed scientific journals.
8. Commit to ethics and compliance responsibilities for being an agricultural engineer, especially with regard to agricultural sector, environment and society.

22 Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction, outline discussion		Face to Face		Synchronous		
	1.2	Discovery of viruses as plant pathogens	A1	Face to Face		Synchronous	Exam, quiz	Chp. 1
2	2.1	Detection of viral plant pathogens and disease diagnosis	A1-A2	Face to Face		Synchronous	Exam, quiz	Chp. 1
	2.2	Detection of viral plant pathogens and disease diagnosis	A1-A2	Face to Face		Synchronous	Exam, quiz	Chp. 1
3	3.1	Detection of plant viruses in plant organs	A2 B1-B3	Face to Face		Synchronous	Exam, quiz, assignment	Chp. 2

			C1-C2					
	3.2	Detection of plant viruses in plant organs	A2 B1-B3 C1-C2	Face to Face		Synchronous	Exam, quiz, assignment	Chp. 2
4	4.1	Detection of viral pathogens in seeds and planting materials	A2 B1-B3 C1-C2	Face to Face		Synchronous	Exam, quiz, assignment	Chp. 2
	4.2	Detection of viral pathogens in seeds and planting materials	A2 B1-B3 C1-C2	Face to Face		Synchronous	Exam, quiz, assignment	Chp. 2
5	5.1	Different protocols will be discussed (Biological tests, physio-chemical tests, immunoassays and nucleic acid-based techniques)	A2 B1-B3 C1-C2	Face to Face		Synchronous	Exam, quiz, presentation	Chp. 2
	5.2	Different protocols will be discussed (Biological tests, physio-chemical tests, immunoassays and nucleic acid-based techniques)	A2 B1-B3 C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 2
6	6.1	Detection of plant viruses in soil	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment, report	Chp. 3
	6.2	Detection of plant viruses in soil	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment, report	Chp. 3
7	7.1	Detection of plant viruses in water	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 3
	7.2	Detection of plant viruses in water	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 3
8	8.1	Detection of plant viruses in air	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 3
	8.2	Detection of plant viruses in air	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 3
9	9.1	Detection of plant viruses in alternative host plant species	A2, B2, C1-C2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 3
	9.2	Midterm exam						

10	10.1	Assessment of variations in biological characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
	10.2	Assessment of variations in biological characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
11	11.1	Assessment of variations in physic-chemical characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
	11.2	Assessment of variations in physic-chemical characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
12	12.1	Assessment of variations in immunological characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
	12.2	Assessment of variations in immunological characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
13	13.1	Assessment of variations in genomic characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
	13.2	Assessment of variations in genomic characteristics of plant viral pathogens	A3, C1	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 4
14	14.1	Diagnosis of viral diseases of plants	B1-B3, D1-D2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 5
	14.2	Diagnosis of viral diseases of plants	B1-B3, D1-D2	Face to Face		Synchronous	Exam, quiz, presentation, assignment	Chp. 5
15	15.1	Students project	A1-A3, B1-B3, C1-C2, D1-D2	Face to Face		Synchronous	Exam, presentation, technical report	
	15.2	Students project	A1-A3, B1-B3, C1-C2, D1-D2	Face to Face		Synchronous	Exam, presentation, technical report	

23 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Midterm exam	30	Wk1- Wk8	A1-A3, B1- B3, C1-C2	9th week	
Activities:	20		A1-A3, B1- B3, C1-C2, D1-D2	At the end of each topic	
1. Quizzes	5				
2. Presentation	5				
3. Report	10				
Final Exam	50	W1- W15 all topics	A1-A3, B1- B3, C1-C2, D1-D2	Will be announced from registrar	

24 Course Requirements

(e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform...etc.):

Students should have a computer, internet connection, and account on Microsoft teams to have access to course materials and for some course activities.

25 Course Policies:

Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints, there will be a committee to review grading the final exam.

For more details about the below issues (**A-F**), please read the University regulations and visit: <http://units.ju.edu.jo/ar/LegalAffairs/Regulations.aspx>

A- Attendance policies.

B- Absences from exams and submitting assignments on time.

C- Health and safety procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior.

E- Grading policy.

From (%)	To (%)	Scale	Mark	Result
0	59	0	C	Fail
60	63	2.5	C+	Good
64	67	2.75	B-	Very Good
68	75	3	B	Very Good
76	79	3.5	B+	Very Good
80	83	3.75	A-	Excellent
84	100	4	A	Excellent

F- Available university services that support achievement in the course:

26 References:

Text Book/Main Reference:

Narayanasamy, P. 2011. Microbial Plant Pathogens-Detection and Disease Diagnosis, Viral and Viroid Pathogens, Volume 3. Springer New York, Heidelberg Dordrecht, London. 321 pp.

Other References:

1. Bos, L. 1983. Introduction of Plant Virology. Longman, London and New York. 329 pp.
2. Bos, L. 1999. Plant Viruses, unique and intriguing pathogens. Backhuys Publishers, Leiden, Netherlands. 358 pp.
3. Dijkstra, J., De Jager, C. P. 1998. Practical Plant Virology. Protocols and Exercises. Springer-Verlag, Berlin. 459 pp.
4. Hadidi, A., Khetarpal, R. K., Koganezawa, H. 1998. Plant Virus Disease Control. APS Press, St. Paul. 684 pp.
5. Matthews, R. E. F. 1992. Fundamentals of Plant Virology. Academic Press, New York. 403 pp.
6. Plant Viruses Online (<http://www.dpvweb.net>)
7. Sutin, D. D., Ford, R. E., Tosic, M. M. 1999. Handbook of Plant Virus Diseases. CRC Press, New York. 553 pp.
8. Uyeda, I. and Masuta, C. 2015. New Approaches to Detect Viruses and Host Responses. Human Press, Springer New York, Heidelberg Dordrecht, London. 292 pp.

9. Walkey, D. 1991. Applied Plant Virology. Chapman and Hall, New York. 338 pp.
10. Selected papers will be discussed.

27 Additional information:

Certain lectures may be converted into practical (virtual).

Name of Course Coordinator: -----Signature: ----- Date: -----
Head of Curriculum Committee/Department: ----- Signature: -----
Head of Department: ----- Signature: -----
Head of Curriculum Committee/Faculty: ----- Signature: -----
Dean: ----- Signature: -----