مركز الاعتماد وضمان الجودة

Course Syllabus

1	**Course title**	Seed Pathology	
2	**Course number**	0606931	
3	**Credit hours**	3	
	Contact hours (theory, practical)	Theory 3	
4	**Prerequisites/co-requisites**	-	
5	**Program title**	☐ BSc ☐MSc **X** PhD of Plant Protection	
6	**Program code**		
7	**Awarding institution**	The University of Jordan	
8	**School**	School of Agriculture	
9	**Department**	Plant Protection	
10	**Course level**	☐ BSc ☐MSc **X** PhD	
11	**Year of study and semester (s)**	2021/2022 **X** first ☐second ☐ summer	
12	**Other department (s) involved in teaching the course**	None	
13	**Main teaching language**	English	
14	**Delivery method**	☐Face to face learning **X** Blended ☐Fully online	
15	**Online platforms(s)**	**X** Moodle **X** Microsoft Teams ☐Skype ☐Zoom ☐Others……	
16	**Issuing/Revision Date**	20/10/2021	

17 Course Coordinator:

Name: Kholoud M. Alananbeh	Contact hours: 10.00-12.00 Sunday, Tuesday
Office number: 124 / 144	Phone number: 22424
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18 Other instructors:

Name: Dr. Luma Albanna Office number: 176 Phone number: 22530 Email: lalbanna@ju.edu.jo Contact hours:8-9 Sunday, Tuesday and Thursday; 11-12 Monday and Fridays, by messages on Microsoft teams during week days and not on weekends please, or by appointment taken by Microsoft teams messages Name: Dr. Nehaya Alkarablieh Office number: 184 Phone number: 22343 Email: n.alkarablieh@ju.edu.jo Contact hours: Tuesday and Thursday, 12:30-14:30

19 Course Description:

The objectives of this course is to give the students an idea about seed- pathology and its history, seed borne diseases, their causal agents, including fungi, bacteria, viruses, and nematodes, seed health testing, mechanism of transmission and seed infection, detection, diagnosis, and management of seed-borne and seed-associated causal organisms.

20 Course aims and outcomes:

Aims:

At the end of the course, students will become familiar with the seed pathology concept, its history, seed borne fungi, seed borne bacteria, seed borne nematodes, seed borne viruses, diagnosis, detection, and management of seed borne organisms.

B- Students Learning Outcomes (SLOs):

A.1 Know what seed pathology is and what are seed-borne pathogens.
A.2 Know detection method of seed-borne pathogens

B.1 Be able to diagnose and manage seed-borne pathogens.
B.2 Understand Mechanism of seed transmission and seed infection

C.1 Apply the knowledge of seed pathology for identifying and diagnosing different seed-borne pathogens (fungi, bacteria, nematodes, viruses).
C.2 Integrate different approaches for seed-borne pathogens management.

D.1 Know the different techniques for seed health testing and mechanisms of seed transmission for the different seed-borne pathogens.
D.2 Know the management measures for the different seed-borne pathogens.

Upon successful completion of this course, students will be able to:

1. Demonstrate a depth in understanding of the fundamental knowledge and skills required in the field of Plant Protection sciences, which include weeds, insects, mites, fungi, bacteria, viruses and nematodes.
2. Identify and distinguish harmful and beneficial weeds, insects, mites, fungi, bacteria, and nematodes.
3. Predict the outbreaks of pests and determine the level of infection based on skills gained in the field of Plant Protection Sciences.
4. Recognize different techniques (biological, chemical, cultural, and physical) in pest control.
5. Design and develop appropriate management strategies of pests in an environmentally friendly manner.
6. Participate efficiently in agricultural projects in the field of pest management in various public and private sectors in Jordan and worldwide.
7. Communicate effectively in written, oral, and graphical forms.
8. Employ the gained skills in communication and serving different communities.
9. Commit to ethics and compliance responsibilities for being an agricultural engineer, especially with regard to the agricultural sector, environment and society.

Program PLOs / SLOs of the course	PLO (1)	PLO (2)	PLO (3)	PLO (4)	PLO (5)	PLO (6)	PLO (7)	PLO (8)	PLO (9)
Knowledge and Understanding									
A.1	X	X							
A.2					X	X	X		
B.1								X	X
B.2	X	X							
C.1	X	X	X						
C.2						X	X	X	
D.1	X								
D.2				X	X	X		X	

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome (ILOs)	Learning Methods Face to Face (FF) Blended (B) Fully Online (FO)	Platform (MS teams MS), Moodle (M))	Lecturing Synchronous (S) Asynchronous	Evaluation Methods Assignment (A) Exam (E) Presentation (P) Quiz (Q) Report (R)	Resources
1	1.1	Introduction	A.1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
	1.2	Impact of Seed-Borne Phytopathogens or Seed-Borne Diseases on Agriculture and Society	A.1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
2	2.1	History of Seed Pathology	A.1	Blended,Face to face	MS teams	☐S ■AS	A, E, P, Q	1,2
	2.2	Seed Health Testing and Seed Certification	A.2,D.1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
3	3.1	Mechanism of Seed Transmission and Seed Infection	B.2,D.1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
	3.2	Mechanism of Seed Transmission and Seed Infection	B.2,D.1	Blended,Face to face	MS teams	☐S ■AS	A, E, P, Q	1,2
4	4.1	**Nematodes**: Detection and Diagnosis of Seed-Borne and Seed-Associated Nematodes	A.2, B.1,C.1,D. 1	Blended,Face to face	MS teams	■S ☐AS	E	1,2
	4.2	**Nematodes**: Detection and Diagnosis of Seed-Borne and Seed-Associated Nematodes	A.2, B.1,C.1,D. 1	Blended,Face to face	MS teams	■S ☐AS	A,	1,2
5	5.1	**Nematodes**: Seed-Borne and Seed-Associated Nematodes	A.1,C.1	Blended,Face to face	MS teams	☐S ■AS	P, E	1,2
	5.2	**Nematodes**: Seed-Borne and Seed-Associated Nematodes	A.1,C.1	Blended,Face to face	MS teams	■S ☐AS	E	1,2

6	6.1	**Nematodes**: Management of seed-borne nematodes	B.1, C.2,D.2	Blended,Face to face	MS teams	■S ☐AS	A	1,2
	6.2	**Nematodes**: Management of seed-borne nematodes	B.1, C.2,D.2	Blended,Face to face	MS teams	☐S ■AS	E, P	1,2
7	7.1	**Bacteria**: Detection of Seed and Propagating Material-Borne Bacterial Diseases of Economically Important Crop	A.2, B.1,C.1,D. 1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
	7.2	**Bacteria**: Detection of Seed and Propagating Material-Borne Bacterial Diseases of Economically Important Crops	A.2, B.1,C.1,D. 1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
8	8.1	**Bacteria**: Diversity of Seed-Borne Bacterial Phytopathogens	A.1, B.1,C.1	Blended,Face to face	MS teams	☐S ■AS	A, E, P, Q	1,2
	8.2	**Midterm Exam**		Face to face	MS teams			
9	9.1	**Bacteria**: Diversity of Seed-Borne Bacterial Phytopathogens	A.1, B.1,C.1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
	9.2	**Bacteria**: Management of seed-borne bacteria	B.1, C.2,D.2	Blended,Face to face	MS teams	☐S ■AS	A, E, P, Q	1,2
10	10.1	**Fungi**: Diagnosis and Detection of Seed-Borne Fungal Phytopathogens	A.2, B.1,C.1,D. 1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
	10.2	**Fungi**: Diversity of Seed-Borne Fungal Phytopathogens	A.2, B.1,C.1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2
11	11.1	**Fungi**: Management of seed-borne fungi	B.1, C.2,D.2	Blended,Face to face	MS teams	☐S ■AS	A, E, P, Q	1,2
	11.2	**Viruses**: Detection and Diagnosis of Seed-Borne Viruses and Virus-Like Pathogens	A.2, B.1,C.1,D. 1	Blended,Face to face	MS teams	■S ☐AS	A, E, P, Q	1,2

12	12.1	**Viruses**: Genetic Diversity, Transmission and Understanding of Seed-Borne Viruses and Phytoplasma	A.1,C.1,D.1	Blended,Face to face	MS teams	☐S ☐AS	A, E, P, Q	1,2
	12.2	Management of Seed-Borne Pathogens/Diseases	B.1, C.2,D.2	Blended,Face to face	MS teams	☐S ☐AS	A, E, P, Q	1,2
13	13.1	Management of Seed-Borne Pathogens/Diseases	B.1, C.2,D.2	Blended,Face to face	MS teams	☐S ☐AS	A, E, P, Q	1,2
	13.2	Management of Seed-Borne Pathogens/Diseases	B.1, C.2,D.2	Blended,Face to face	MS teams	☐S ☐AS	A, E, P, Q	1,2

22 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	A,B,C,D	9th week	Face to face
Activities ✓ Home works ✓ Presentation ✓ Research paper ✓ Discussions	30	W7-W15	A,B,C,D	At the end of each topic	Test portal, MS teams Face to face
Final exam	40	W1-W15 All topics	A,B,C,D	Will be announced from register	Face to face

23 Course Requirements

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

Students should have a computer or smart phone with internet connection, and should be familiar with Microsoft teams, Moodle, and zoom.

24 Course Policies:

A- Attendance policies: Students should attend all classes on time. <15%, <20% with a permission ; medical report

B- Absences from exams and submitting assignments on time: Students should not be absent from exams and if they do then a convincing excuse should be provided. Assignments should be submitted on schedule.

C- Health and safety procedures: When in class, students should follow safety measures be wearing masks and keep at least one meter between each other.

D- Honesty policy regarding cheating, plagiarism, misbehavior: Students should be honest with ethical behavior.

E- Grading policy: Mentioned in section 22.

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

Microsoft and Moodle platforms and classes for face to face teaching.

25 References:

A- Required book(s), assigned reading and audio-visuals:

1. Kumar, R.; Gupta, A.Seed-Borne Disease of Agricultural Crops: Detection, Diagnosis e Management; Kumar, R., Gupta, A., Eds.;Springer Nature: Singapore, 2020.
2. Sellaperumal, C., Gautam Chawla, C., and Singh , KP. 2016. Detection and Survival of Root-Knot Nematode in Harvested Bulbs of Tuberose. Indian Journal of Nematology 43, 160-167.
3. William T. Crow and Dunn, RA. 2005. Nematode Management for Nursery Crops (Ornamentals and Planting Stock of Fruits and Nuts). Department of Entomology and Nematology, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published: March 1997. Revised: November 2005. Please visit the EDIS Web site at http://edis.ifas.ufl.edu.
4. Poirier,S., Dauphinais,N., Bélair,G., Gravel, V., and Mimee, B. 2019. Validation of extraction methods for diagnosis of the stem and bulb nematode *Ditylenchus dipsaci*, Canadian Journal of Plant Pathology, 41:4, 597-602, DOI: 10.1080/07060661.2019.1624390
5. Islam,S., Rahman, H., Farazi,M., Hossain, AT and Sultana, A. 2015. Integrated Management of Seed borne Nematode (*Aphelenchoides besseyi*) in T. Aman Rice (*Oryza sativa* L.). The Agriculturists 13(1): 79-86.

B. Recommended books, materials, and media:

Neergaard, P. (1977) Seed-plant transmission, establishment of infection and course of disease. In Seed Pathology: Volume I. London, UK: Macmillan Education, pp. 411– 434.

26 Additional information:

Laboratory schedule: No laboratory for this course.

Name of Course Coordinator: Kholoud M. Alananbeh Signature: ---------- Date: ----------
Head of Curriculum Committee/Department: ---------- Signature: ----------
Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------