مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

Course Syllabus

1	**Course title**	Economic Nematology
2	**Course number**	0606762
3	**Credit hours**	3
	Contact hours (theory, practical)	3
4	**Program title**	MSc. In Plant protection
5	**Program code**	
6	**School**	School of Agriculture
7	**Department**	Department of Plant protection
9	**Course level**	MSc
10	**Year of study and semester (s)**	2022/2023S2
11	**Other department (s) involved in teaching the course**	/
13	**Main teaching language**	English
14	**Delivery method**	X Face to face learning ☐Blended ☐Fully online
14	**Online platforms(s)**	☐Moodle ☐Microsoft Teams ☐Skype ☐Zoom
15	**Issuing/Revision Date**	Feb 20th 2021

17 Course Coordinator:

Name: Dr. Luma Al Banna	Contact hours: 8-9 Sunday; 11-12 Tuesday and Thursday
Office number: 144	Phone number:22530 Email: lalbanna@ju.edu.jo

18 Other instructors:

19 Course Description:

As stated in the approved study plan.

This course deals with historical background, economic aspects of crop losses, nematode diseases of major crops, ecological and epidemiological factors influencing diseases attributed to nematodes, methods of nematode control through integration of biological, cultural, chemical and regulatory means.

20 Course aims and outcomes:

A- Aims:

- To understand nematode damage; ecological factors that influence nematode populations and disease development, to manage plant parasitic nematodes.
- To learn to critically evaluate research papers ·
- To improve skills for oral communication of scientific idea

B- Students Learning Outcomes (SLOs):

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

PLOs / SLOs of the course	1	2	3	4	5	6	7	8
A1. Understand methods used to diagnose and estimate nematode damage	√							
A2. Understand population and community ecology	√							
A3. Understand the fundamentals of integrated nematode management.	√	√	√					
B1. Gain an increased self-confidence in one's personal ability regarding economic nematology.		√	√		√			
B2. Gain an ability to critically analyze a problem or issue from an ecological perspective		√	√	√	√			√
C1. Derive principles of plant disease management from knowledge of nematode ecology, biology and pathology		√	√		√			√
C2. Evaluate different techniques in nematode management	√							
D1. Solve problem			√	√	√			√
D2. Plan and manage time		√			√			

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.

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction to Economic Nematology ; outline ,	A1	Face to Face		Synchronous	Mid & final	
	1.2	Historical background- **Importance of Phytonematodes in World Agriculture**; A perspective on nematode problems worldwide	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
2	2.1	Economic aspects of crop losses; Introduction : classification of plant parasitic nematodes - Functional Morphology of nematodes	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
	2.2	Economic aspects of crop losses; Crop loss assessment in Nematology	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
3	3.1	Economic aspects of crop losses; Crop loss assessment in Nematology	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
	3.2	Economic aspects of crop losses; Crop loss assessment in Nematolog	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
4	4.1	Economic aspects of crop losses	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
	4.2	Economic aspects of crop losses	A1	Face to Face		Synchronous	Mid & final	1, 2, 5, 9-10
5	5.1	Nematode diseases of major crops; Vegetables	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Mid & final	1 -2
	5.2	Nematode diseases of major crops; Vegetables	A1, A3, B1-B2,	Face to Face		Synchronous	Mid & final	1-2

			C1-C2, D1					
6	6.1	Nematode diseases of major crops; Field crops	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Mid & final	1-2
	6.2	Nematode diseases of major crops; Field crops	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Mid & final	1-2
7	7.1	Nematode diseases of major crops; Fruit trees	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Mid & final	1-2
	7.2	Nematode diseases of major crops; Fruit trees	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Mid & final, Presentation	1-2
8	8.1	Nematode diseases of major crops; Forest trees , shrubs and ornamental plants	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Mid & final, Presentation	1-2
	8.2	Nematode diseases of major crops; Forest trees , shrubs and ornamental plants	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-2
9	9.1	Ecological and epidemiological factors influencing diseases attributed to nematodes; Geographic and Spatial distribution	A2, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-4,6
	9.2	Midterm						
10	10.1	Ecological and epidemiological factors influencing diseases attributed to nematodes; Physical factors	A2, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-4,6
	10.2	Ecological and epidemiological factors influencing diseases attributed	A2, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-4,6

		to nematodes; Biological factors						
11	11.1	Methods of nematode control through integration of biological, cultural, chemical and regulatory means.	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
	11.2	Methods of nematode control through integration of biological, cultural, chemical and regulatory means.	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
12	12.1	Methods of nematode control through integration of biological, cultural, chemical and regulatory means.	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
	12.2	Methods of nematode control through integration of biological, cultural, chemical and regulatory means.	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
13	13.1	Methods of nematode control through integration of biological, cultural, chemical and regulatory means.	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
	13.2	Methods of nematode control through integration of biological, cultural, chemical and regulatory means.	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
14	14.1	Students Projects	A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	1-3, 7
	14.2	Students Projects	B1-B2, C1-C2, D1-D2	Face to Face		Synchronous	Final	
15	15.1	Students Projects	B1-B2, C1-C2, D1-D2	Face to Face		Synchronous	Final	
	15.2	Students Projects	A1, A3, B1-B2, C1-C2, D1	Face to Face		Synchronous	Final	

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
First Mid-Term Exam	30%	W1-w8	A1, A3, B1-B2, C1-C2, D1-D2	**9th week**	
Activities: 1. In class work 2. Presentation (2 presentations) a. Research paper b. INM project	30% (5 points) (8 points) (17 points)	W7-W15	A1,-A3, B1-B2, C1-C2, D1-D2	At the end of each topic	
Final Exam	40%	W1-W15 all topics	A1,-A3, B1-B2, C1-C2, D1-D2	Will be announced from registrar	

23 Course Requirements

students should have a computer, internet connection,

24Course Policies:

A- Attendance policies:
<15% , <20% with a permission ; medical report

B- Absences from exams and submitting assignments on time:

- **Assignments will not be accepted after deadline**
- **Absence of exams with a medical report must be submitted following regulations and a makeup exam will be scheduled within one week**

C- Health and safety procedures:

- **Mask must be worn all the time in class and lab**
- **Social distancing**

D- Honesty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy:

From (%)	To (%)	Scale	Mark	Result
0	54	0	C	Fail
55	59	2.5	C+	Good
60	64	2.75	B-	Very Good
65	74	3	B	Very Good
75	79	3.5	B+	Very Good
80	85	3.75	A⁻	Excellent
86	100	4	A	Excellent

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

25 References:

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

Text Book:

1. Whitehead, A. G. 1998. Plant Nematode Control. CAB International, New York, pp 384
2. Manual of Agriculture Nematology, Nickle,

References:

3. Bonifacio, L. F. Sousa, E. Naves,P. Maria L In´acio, ML. Henriques, J. Mota, M. Barbosa, P. Drinkallc, MJ. And Buckleyd, S. 2013. Efficacy of sulfuryl fluoride against the pinewood nematode, *Bursaphelenchus xylophilus* (Nematoda: Aphelenchidae), in *Pinus pinaster* boards.
4. Dong, Y.; Jin, P.; Zhang, H.; Hu, J.; Lamour, K.; Yang, Z. Distribution and Prevalence of Plant-Parasitic Nematodes of Turfgrass at Golf Courses in China. Biology 2022, 11, 1322. https:// doi.org/10.3390/biology11091322
5. Holgado, R., Oppen Skau, K.A. and Magnusson, C. 2009. Field damage in potato by lesion nematode *Pratylenchus penetrans*, its association with tuber symptoms and its survival in storage Nematologia Meditterranea, 37: 25-29 25.
6. Lopez-Nicora,HD, Enciso-Maldonado, GA., and others. 2022. Distribution and Abundance of Nematodes in Horticultural Production in Paraguay. Plant Health Progres, 23:466–475
7. Moseley, D. Patton,A. Bateman, R. and Kirkpatrick, T.2010. Controlling Nematodes on Golf Courses. University of Arkansas, United States Department of Agriculture, and County Governments

Cooperating

8. Noling, JW. Nematode Management in Onions.University of Florida Extension
9. Shaver, BR Agudelo, P., Martin, SB. 2017. Damage Functions for Sting Nematode (*Belonolaimus longicaudatus*) on Bermudagrass Turf. International Turfgrass Society Research Journal, 13:517-523.
10. Seinhorst, 1965. The relation between nematode density and damage to plants. Nematologica 11, 137:154.

Recommended books, materials, and media:

B- Recommended books, materials, and media:Videos In class and will be deposited on elearning

- Soybean cyst nematodeURL
- website Pinewilt nematodeURL
- Video to manage nematodes on potatoURL

26 **Additional information:**

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