



Course Syllabus

1	Course title	Parasitic Flowering Plants
2	Course number	(0606331)
3	Credit hours	3
	Contact hours (theory, practical)	2,1
4	Prerequisites/corequisites	Biology 1
5	Program title	Bsc. In Plant protection
6	Program code	
7	Awarding institution	
8	School	School of Agriculture
9	Department	Department of Plant Protection
10	Level of course	Third
11	Year of study and semester (s)	
12	Other department (s) involved in teaching the course	
13	Main teaching language	English
14	Delivery method	X Face to face learning ☐ Blended ☐ Fully online
15	Online platforms(s)	☐ Moodle ☐ Microsoft Teams ☐ Skype ☐ Zoom ☐ Others.....
16	Issuing/Revision Date	March 08, 2024



17. Course Coordinator

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18. Other instructors:

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19 Course Description:

The course covers most problematic parasitic flowering plants and their distribution in the region, their impact on their hosts, especially on the strategic crops. means of management, with emphasis on parasitic plants in Jordan. The course includes conducting some laboratories, field study cases, literature surveys and presentation of research papers.



20 Course aims and outcomes:

A- Aims:

At the end of the course, students will have strong knowledge about parasitic weeds in the following aspects, general categorization and identification of parasitic flowering plants (PFP), the most important parasitic weeds (PW) in the world, the potential impact of PW on agriculture worldwide, PW in Jordan, species, distribution, host range, their impact, and management of PW

B- Student Learning Outcomes (SLOs): Upon successful completion of this course student will be able to:

A1- identify PW

A2- discuss information about the potential impact of PW

A3- discuss/explain the essential concepts and major principles relevant to PW biology and physiology of parasitism

A4- point out PW distribution in Jordan and their management.

B1- use knowledge in identifying types of PW species in a specific area

B2- employ skills acquired in managing PW

C1- Prepare and deliver well-structured reports about PW and their possible management approaches in certain areas

C2- Be aware of the hazards of PW in various areas

D1- initialize and participate in establishing proper effective management of PW

D2- work effectively with farmers (subsistent, small, or large) in minimizing the negative impact of PW

Upon the successful completion of this program (PLOs) student should 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.
Commit to ethics and compliance responsibilities for being an agricultural engineer, especially with regard to the agricultural sector, environment and society.
9. Commit to ethics and compliance responsibilities for being an agricultural engineer, especially with regard to the agricultural sector, environment and society.

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

PLOs	1	2	3	4	5	6	7	8	9
SLOs of the course									
A1- identify PW	√	√							
A2- discuss information about the potential impact of PW	√	√			√				
A3- discuss/explain the essential concepts and major principles relevant to PW biology and physiology of parasitism	√	√	√		√				
A4- point out PW distribution in Jordan and their management.			√	√		√			
B1- use knowledge in identifying types of PW species in a specific area				√	√		√		√
B2- employ skills acquired in managing PW				√	√	√	√	√	√
C1- Prepare and deliver well-structured reports about PW and their possible management approaches in certain areas				√	√	√	√	√	√
C2- Be aware of the hazards of PW in various areas				√	√	√	√	√	√
D1- initialize and participate in establishing proper effective management of PW									
D2- work effectively with farmers (subsistent, small, or large) in minimizing the negative impact of PW									

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods Face to Face (FF) Blended (B) Fully Online (FO)	Platform MS teams (MS) Moodle (M))	Lecturing Synchronous (S) Asynchronous (AS)	Evaluation Methods Assignment (A) Exam (E) Presentation (P) Quiz (Q) Report (R)	Resources
1	1.1	Introduction to course contents, botanical affiliations of PFP and agronomic importance.	A,B,C,D	FF	MS	S	E	1, 2, 4
	1.2	Distribution of parasitic weeds (PW) worldwide	A,B,C,D	FF	MS	S	E	4, 5
2	2.1	Parasitic plants impact in agriculture	A,B,C,D	FF	MS	S	E	1,3, 4,5
	2.2	Biology of PFP in a- Orobanchaceae	A,B,C,D	FF	MS	S	E	3,4, 5
3	3.1	b- Cuscutaceae	A,B,C,D	FF	MS	S	E	1, 3, 4
	3.2	c- Loranthaceae & Viscaceae	A,B,C,D	FF	MS	S	E	1, 2, 4
4	4.1	d- Scrophulariaceae	A,B,C,D	FF	MS	S	E	1, 3, 4
	4.2	e- Santalaceae	A,B,C,D	FF	MS	S	E	1, 4
5	5.1	Host range & impact a- Orobanche, Cistanche	A,B,C,D	FF	MS	S	E	4, 6, 7

	5.2	Host range & impact a- Orobanche, Cistanche	A,B,C,D	FF	MS	S	E	4, 6, 7
6	6.1	b- Host range & impact, Cuscuta spp midterm	A,B,C,D	FF	MS	S	E	4, 6, 7
	6.2	b- Host range & impact, Cuscuta spp midterm	A,B,C,D	FF	MS	S	E	4, 6, 7
7	7.1	c- Host range & impact striga	A,B,C,D	FF	MS	S	E	1, 3, 4
	7.1	c- Host range & impact striga	A,B,C,D	FF	MS	S	E	1, 3, 4
8	8.1	Midterm Exam						
	8.2	d- Host range & impact Viscum , Loranthus:	A,B,C,D	FF	MS	S	E	2, 4, 5
9	9.2	e- Host range & impact Cynomorium & Osyris spp.	A,B,C,D	FF	MS	S	E	4
	9.2	e- Host range & impact Cynomorium & Osyris spp.	A,B,C,D	FF	MS	S	E	4
10	10.1	Methods of Orobanche management Cultural, chemical, physical and biological measurements	A,B,C,D	FF	MS	S	E	4, 5, 9
	10.2	Methods of Orobanche management Cultural, chemical, physical and biological measurements	A,B,C,D	FF	MS	S	E	4, 5, 9
11	11.1	Methods of Cuscuta management Cultural, chemical, physical and	A,B,C,D	FF	MS	S	E	4, 5, 9

		biological measurements						
	11.2	Methods of Cuscuta management Cultural, chemical, physical and biological measurements	A,B,C,D	FF	MS	S	E	4, 5, 9
12	12.1	Methods of Striga management Cultural, chemical, physical and biological measurements	A,B,C,D	FF	MS	S	E	1, 4, 9
	12.2	Methods of Striga management Cultural, chemical, physical and biological measurements	A,B,C,D	FF	MS	S	E	1, 4, 9
13	13.1	Methods of Orobanche management Cultural, chemical, physical and biological measurements	A,B,C,D	FF	MS	S	E	3, 9
	13.2	Possible methods of Viscum and Loranthus management Cultural, chemical, and biological measurements	A,B,C,D	FF	MS	S	E	3, 9
14	14.1	Other parasitic flowering plants in world agriculture	A,B,C,D	FF	MS	S	E	2, 4, 9
	14.2	Review		FF	MS	S	E	2
Final Exam based on university schedule								



22. LABORATORY OUTLINE

Week	Topic	Intended Learning Outcome	Learning Methods Face to Face (FF) Blended (B) Fully Online (FO)	Platform MS teams (MS) Moodle (M))	Lecturing Synchronous (S) Asynchronous (AS)	Evaluation Methods Assignment (A) Exam (E) Presentation (P) Quiz (Q) Report (R)	Resources
1	Laboratory orientation and requirements	A,B,C,D	FF	MS	S	E	1
2	Introduction on parasitic weed collection & preparation	A,B,C,D	FF	MS	S	E	1
3	Slides show on parasitic weeds and problems in Jordan and the world	A,B,C,D	FF	MS	S	E	1
4	Parasitic weed structures: seeds, fruits, haustoria and succors, other modifications	A,B,C,D	FF	MS	S	E	1
5	Parasitic weeds with and without host stimulants. Preconditioning, epicotyl or germination tube structure, haustoria formation and attachment in Petri-dish	A,B,C,D	FF	MS	S	E	1
6	Parasitic weed germination and development	A,B,C,D	FF	MS	S	E	1
7	Glasshouse experiment on parasitic weed management: Orobanche & Cuscuta.	A,B,C,D	FF	MS	S	E	1
8	Parasitic weeds and hosts: Orobanchaceae, Orobanche spp. and Cistanche spp.	A,B,C,D	FF	MS	S	E	1
9	Parasitic weeds and hosts: Cuscutaceae, Cuscuta spp.	A,B,C,D	FF	MS	S	E	1
10	Parasitic weeds and hosts: Viscaceae (Viscum spp.) & Lorantheae (Loranthus spp.)	A,B,C,D	FF	MS	S	E	1
11	Parasitic weeds and hosts: Santalaceae, Osyris & Thesium	A,B,C,D	FF	MS	S	E	1
12	Laboratory work finalization, reporting and evaluation	A,B,C,D	FF	MS	S	E	1



23. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

Learning through lectures, field trips, practical part of this course and laboratory work, weed samples collection, slides on weed species in farm land and natural habitats, literature review, all weed species samples and information on each species are displayed in the laboratory.

24. Evaluation Methods and Course Requirements:

Homework, Quiz, Exam, pre-lab quiz...etc

Each student is required to collect and process certain number of common weed species in agricultural land. Complete information is required on each species. Most recent literature on these species should be consulted. Students are asked to submit a lab reports on each exercise practiced during the laboratory session. Weed collection should be submitted by the end of the semester and before the final exam.

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

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Mid. Term Exam (end of modules 1)	20		6-7 th week	
Lab Mid Exam	10			
Notebook	3			
Assignment	2			
Lab. Reports	5			
Quizzes or other suggested alternative activity	5		Weakly expected, up to 3 quizzes but the highest 2 are considered	
Students' seminar	5			
Lab Final Exam	10			
Final Exam (theoretical and practical)	40		As scheduled by the university	



25. Course 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	38	0	H	Fail
39	41	0.75	D-	Fail
42	47	1	D	Accepted
48	50	1.5	D+	Accepted
51	53	1.75	C-	Good
54	59	2	C	Good
60	62	2.5	C+	Good
63	65	2.75	B-	Very Good
66	71	3	B	Very Good
72	74	3.5	B+	Very Good
75	80	3.75	A ⁻	Excellent
81	100	4	A	Excellent

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

26. Required equipment: (Facilities, Tools, Labs, Training....)

Class room equipped with Smart board and computer, Teaching Lab with fresh and dry samples of weeds, sprayers and calibration tools.



27. References:

1. Caseley, J.C., Cussans, G.W. and Atkin, R.K.(eds.). (1991). *Herbicide Resistance in Weeds and Crops*. Butterworth-Heinemann, Oxford, England.
2. Cobb, A. (1992). *Herbicides and Plant Physiology*. Chapman and Hall. London.
3. Duke, S.O. (1996). *Herbicide-Resistant Crops. Agricultural, Environmental, Economic, Regulatory, and Technical Aspects*. CRC Press, Boca Raton, Florida.
4. Fedtke, C. (1982). *Biochemistry and Physiology of Herbicide Action*. Springer – Verlag, Berlin Heidelberg New York.
5. Fletcher, W.W. and Kirkwood R.C. (1982). *Herbicides and Plant Growth Regulators*. Granada, London, PP. 93-99.
6. Foy, C.L. and Pritchard, D.W. (eds.). (1996). *Pesticide Formulation and Adjuvant Technology*. CRC Press, Boca Raton, Florida.
7. Gorover, R. and Cessna, A.J. (eds.). (1991). *Environmental Chemistry of Herbicides*, Vol. II. CRC Press, Boca Raton, Florida.
8. Hance, R.J. (1980). *Interaction between Herbicides and the Soil*. Academic Press. London
9. Hatfield, J.L., Buhler, D.D. and Stewart, B.A. (eds.). (1998). *Integrated Weed and Soil Management*. Sleeping Bear Press. USA.
10. Hatzios, K.K. and Penner, D. (1982). *Metabolism of Herbicides in Higher Plants*. Burgess Publishing, Minneapolis.
11. LeBaron, H.M. and Gressel, J. (eds.). (1982). *Herbicide Resistance in Plants*. John Wiley & Sons. New York, USA.
12. McWhorter, C.G., and Gebhardt, M.R. (eds.). (1987). *Methods of Applying Herbicides*. No. 4, *Monograph Series of the Weed Science Society of America*, Lawrence, Kansas.
13. Powles, S.B. and Holtum, J.A.M. (eds.). (1994). *Herbicide Resistance in Plants. Biology and Biochemistry*. Lewis Publishers, Boca Raton, Florida.
14. Qasem, J.R. (2003). *Weeds & their Control*. Deanship of Academic Research, University of Jordan, Amman, Jordan. 628 PP. (Reference in Arabic).
15. Schnoor, J.L. (1992). *Fate of Pesticides and Chemicals in the Environment*. John Wiley-Interscience, New York.
16. Weed Science Society of America. (1979). *Herbicide Handbook*. 4th Edition. Champaign, IL.
17. Weed Science Society of America.(1994) *Herbicide Handbook*, 7th Edition. K.S. Lawrence.



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28. Additional information:

Name of Course Coordinator: Dr. Wisam Obeidat-Signature: ----- Date: March 08, 2024

Head of Curriculum Committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----