Jordan University of Science and Technology

Faculty of Agriculture

Plant Production Department

PP744 Advanced Economic Entomology

First Semester 2020-2021

Course Catalog
3 Credit Hours. This course is designed to introduce students to the concepts of agricultural entomology and pest management emphasizing theory and practice of pest population management; economic threshold; current research; population modeling; sampling techniques; data analysis; ecological bases for control; control by host resistance and by biological, genetic, physical, behavioral, cultural, and chemical means; integrated systems of pest management

Text Book	
Title	Fruit Flies (Tephritidae): Phylogeny and Evolution of Behavior.
Author(s)	Aluja M. and Norrbom A.
Edition	1st Edition
Short Name	Ref # 1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref # 2	Fruit Flies Biology and Management	Aluja M. and Leido P.	1st Edition	
Ref # 3	Trapping and the Detection, Control, and Regulation of Tephritid Fruit Flies; Lures, Area-Wide Programs, and Trade Implications.	Shelly, T.E., Epsky, N., Jang, E.B., Reyes-Flores, J., and Vargas, R.I.	1st Edition	
Ref # 4	Aphids on the World's Crops: An Identification and Information Guide,	Blackman R. L. and Eastop V. F.	2nd Edition	
Ref # 5	Insect Pests Management of Fruit Crops	Kumar A. and Pandey, P. M.	1st Edition	

Ref # 6	Natural Occurrences, Biological Control & Plant Responses (Insects and Other Terrestrial Arthropods: Biology, Chemistry and Behavior)	Reeves D.	1st Edition	
Ref # 7	Thrips as Crop Pests	Lewis T.	1st Edition	
Ref # 8	Mites: Ecology, Evolution and Behaviour	CABI	1st Edition	

Instructor	
Name	**Prof. Hail Shannag**
Office Location	C4L2
Office Hours	
Email	hail@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 10:00 - 11:30 Room: منصة الكترونية

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction	
Weeks 1, 2	Fruit Flies including problems, distribution and host relationships, biology, natural enemies, sampling and monitoring, trapping and baits, control and suppression	From **Ref # 2**, From **Ref # 3**
Week 3	Mediterranean Fruit Flies	From **Ref # 2**, From **Ref # 3**
Week 4	Present current research finding in the group discussion	
Week 5	Olive Fruit Fly, Oral presentation of the case-study focusing on some current aspect on this topic	From **Ref # 2**, From **Ref # 3**
Week 6	Aphids including taxonomy and systematic, characteristics, life history, host range, damage, feeding ecology, aphid relations with ants, infestation recognition, polyphenism, migration and dispersal, aphid defense, suppression tactics for managing aphid infestation, new approaches to managing aphid population and insecticide resistance, special (aphid) terminology	From **Ref # 4**

Week 7	Oral presentation of current research findings focusing on some aspects of aphids	
Weeks 8, 9	Insect pests of apple trees including green apple aphid, wooly apple aphid, leopard moth, and codling moth	From **Ref # 5**
Week 10	Presentation of case-studies dealing with current research finding of apple insect pests	
Week 11	Flatheaded woodborer (Capnodis tenebrionis) and its economic significance and management in stone fruit orchards, with presentation of outcomes of current scientific articles	
Week 12	Grape Erineum Mite and European Grapevine Moth	
Week 13	Thrips including identification, life cycle, damage, monitoring, and management	From **Ref # 7**
Week 14	Two spotted-spider mite	From **Ref # 8**
Week 15	Whiteflies	

Mapping of Course Outcomes to Program Student Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
Identify the major arthropod pests of the major horticultural and field crops through general appearance and symptoms	10%	
Assess the biology, ecology, behavior, life history and host range of the each pest	10%	
Inspect the pest complex of the agro-ecosystem with a broad idea of ecology and tritrophic interaction amongst host plants, pests and their natural enemies	15%	
Demonstrate skill in determining pest levels and impact on plant hosts	10%	
Justify the relationship of sustainable agriculture with pest management; inspect all facts of modern pest management programs aimed at minimizing the negative impacts of insect outbreaks, including sampling and monitoring, interpretation of available thresholds to relate plant damage to stand-level management decisions, and multiple management strategies with describing their strengths, weaknesses and compatibility	20%	
Assess different components of integrated pest management to reduced pest population below economic injury level and justify how the integrated pest management fit with traditional and alternative control measures in ago-ecosystems	15%	
Investigate given situations and design a plan to solve complex pest management problems using critical and creative thinking	10%	
Illustrate critical thinking skills in scientific communication including using the scientific literature effectively, demonstrating of oral or written proficiency in economic entomology with colleagues and the general public; address complex problem facing entomology provincials taking into account related ethical, social, legal, economic and environmental issue	10%	

Relationship to Program Student Outcomes (Out of 100%)						
PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7

Evaluation	
Assessment Tool	**Weight**
First Exam	20%
Second Exam	20%
Assigment	10%
Final Exam	50%

Policy	
Teaching & Learning Methods	Power Point presentations will be used to deliver lectures, which will include text and images strengthened by narration to emphasize key points. A discussion of the latest advances in agricultural insect pests and their management will be presented. The latest and up-to date research findings related to new or improved practices will be discussed. Topics of discussion will include subject matter presented in the course outline. Each student is expected to take good lecture notes and to complete all reading assignments. All reading material will not be discussed in class lectures, but the student is still responsible for being familiar with these parts of the assignments. Asynchronous discussion threads will be used to assess student comprehension of lecture and reading materials. Answering of questions arising from literature and statements; reporting on a case study and oral presentations. We will discuss how insects function, and relate the basics of what was learned to insect management and control.
Assigned Readings	Students will be assigned reading material and encouraged to present current research findings in the group discussion. The purpose of these articles is to reinforce the content presented in lecture and to learn how to critically read and present scientific articles is an important skill for anyone in the sciences. Scientific research articles report original research findings and scientific review articles provide a synthesis of important research findings and ideas on a given topic.
Exams	All exams are closed book and notes. The final exam is comprehensive covering all teaching materials. Incomplete exams need approval from the department chair and the faculty dean.
Cheating	Prohibited; and in case of cheating the student will be subject to punishment in according with the university regulations.
Attendance	Students are expected to attend all class meetings regularly. If the student is absent for more than 20% of the course, the student will be prevented from taking all subsequent exams and assigned an F (Failure) grade in the course (deprived by absence). The maximum includes both excused and unexcused absences.
Participation	Participation is highly encouraged.
Withdraw	The student can withdraw from the course in accordance with the timeline defined by the university regulations.

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