

Spring 2017
Greenhouse Pest Management: Methods and Practice
ENTO 497c / ENTO 597c

Class Time/Location

2:00 – 4:50pm Tuesdays
CEAC Room 117 (classroom)
Campus Agriculture Center
Controlled Environment Agriculture Center
1951 E Roger. Rd.

Instructor

Dr. Stacy Tollefson
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Office hrs: by appt.

Course Description: Pest management skills development in the Controlled Environment Agriculture Center (CEAC) teaching/research greenhouses, with hands-on assignments, and group discussion covering pest management principles, methods, and current practice. Graduate-level requirements include a 20-page research paper on some aspect of greenhouse pest management, pre-approved by the instructor. Cross-listed as ABE/AGMT 497c, EIS 597c

Enrollment Requirements:

PLS 217. Advanced Standing: Engineering. Major or minor: AGTM, ENTO, or PLS. Junior or Senior status. Or approval of instructor.

Course Objectives:

1. Develop a working knowledge of the identification, biology, economic impact, sampling and management methods for the major pest and beneficial arthropod species found in greenhouse crop production.
2. Conduct monitoring programs for pest and beneficial arthropod populations in the CEAC teaching/research greenhouses.
3. Provide current data management and evaluation support for CEAC arthropod management programs.
4. Become knowledgeable of the laws and regulations governing worker protection and safety in greenhouse settings.

Course Format:

Lecture, discussion, greenhouse work. Students will spend at least 60 minutes most class periods in the CEAC greenhouses scouting/identifying pests. Course will use D2L and GoogleDocs.

Required Textbook:

There is no required textbook. Students are responsible for material presented in class, on Powerpoints, and in readings. Reading material and Powerpoints will be posted in D2L. A few helpful resources are:

Knowing and Recognizing: The Biology of Glasshouse Pests and Their Natural Enemies.
M. Malais, W. J. Ravensberg. Koppert Biological Systems. This is an excellent, color reference.

California Statewide Integrated Pest Management website is an excellent resource we will rely heavily on in this course. <http://www.ipm.ucdavis.edu/>

Additional Materials and Supplies:

Each student must obtain a loupe or magnifying lens with at least 15x power. These may be purchased from the instructor at cost – cost is \$5, cash only. A camera with zoom lens is not required but may be desired.

Grading Policy:

Assignments and Grading:

All points, as listed below, will count toward the final grade.

Undergraduate Students:

Has a loupe by Jan 24	=	10	448-500 (90%)	= A
12 Scout reports (10 pts each)	=	120	398-447 (80%)	= B
7 Homework Assignments	=	70	348-397 (70%)	= C
Scout Summary Report	=	100	298-347 (60%)	= D
Midterm Exam	=	100	Below 298	= E
Final Exam	=	100		
Total	=	500		

Graduate Students:

Has a loupe by Jan 24	=	10	627-700 (90%)	= A
12 Scout reports (10 pts each)	=	120	557-626 (80%)	= B
7 Homework Assignments	=	70	487-556 (70%)	= C
Scout Summary Report	=	100	417-486 (60%)	= D
Midterm Exam	=	100	Below 417	= E
Final Exam	=	100		
Research Paper	=	200		
Total	=	700		

Midterm and Final Exams: These exams will involve basic essential points covered in the lectures and in the greenhouse. They may consist of multiple-choice, fill in the blank, true/false, short answer/essay, or identification of pictures, among others.

12 Weekly Scouting Reports: Students will be assigned to one tomato section that they will monitor all semester. The class will be split into 2 groups to switch off scouting the peppers and cucumbers. In addition to the tomato section, Group 1 will monitor one bell pepper bag (3 plants with 12 heads) for the first 6 weeks and then for the second 6 weeks, they will monitor one cucumber bag (3 plants). Group 2 will monitor one cucumber bag for the first 6 weeks and

then switch to one bell pepper bag for the second 6 weeks. Each week students will **scout their plants** (tomatoes and peppers or cucumbers) and record results on **scouting sheets which must be turned in at the end of class**. In addition, they will look at their sticky traps and record number and types of pests they find on a datasheet and then **enter this data into GoogleDocs by 5pm the next day** (Wednesday). Student will receive 10pts for each scouting session (4 pts for tomato plants, 3 pts for peppers or cucumber, 3 pts for entering sticky trap data into database.) **If the sticky trap data is not entered in GoogleDocs by 5pm Wednesday, the student loses 3pts.**

Assignments: Students will be given 7 homework assignments throughout the semester. These will typically involve reading some information on the topic to be covered in the following lecture and answering questions about it.

Graduate Student Paper: Graduate students will be required to write a 20 page double-spaced paper (12 pt font) on some aspect of greenhouse pest management. The topic must be approved by the instructor by February 28, 2017. The paper is due on the last day of class, May 2.

Testing policy: All tests will cover both lecture and greenhouse material. Make-ups will only be given in case of a documented medical emergency or out-of-town events associated with a degree program (ex. Ag Ed FFA Conf. etc.). For unforeseen medical emergencies (with doctor's excuse), **make-ups will be written / oral**. For prescheduled out-of-town events, **the written test must be taken prior to leaving.**

Absences and late work: Students are expected to attend all classes and submit all assignments on or before the due dates. As per University policy, guidelines for absences may be set by the instructor. See UA Policies: <http://catalog.arizona.edu/2014-15/policies/classatten.htm> You must be in class during regular class time, both lecture and greenhouse time (Tues 2-4:50pm) to get points for the daily scouting reports. Scouting reports **MUST** be turned in before leaving the greenhouse each day. A grade of "0" will be assigned on daily scouting reports if the work is turned in after that day, and any other late assignments will be assigned a grade of "0", unless there are extenuating circumstances, as approved by the instructor. Three or more unexcused absences may be cause for administrative drop. In the event of an unexcused absence, scouting for that day cannot be made up.

Excused vs Unexcused Absences:

Absences are considered **unexcused** (car breaks down, dog in the hospital, etc.) unless the following applies:

Attendance at a UA sponsored event: If you are going to miss class for a UA approved event, that absence will be excused **ONLY IF** you inform the instructor at least a week before the

absence and present a Dean's excuse at that time. Dean's excuses will not be honored after the fact. **Only one class may be missed with a Dean's excuse.**

Sickness: If you are sick, you must inform the instructor as soon as possible before the missed class and arrange for scouting to be done within 48 hours in order to receive full credit. More than one sick day per semester requires a doctor's note to be able to make up the scouting for each additional day, but it still must be made up within 48 hrs.

Religious holiday: All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean designee) will be honored. Students MUST give the instructor a list of these events within the first 7 days of the semester AND make arrangements, at that time, to make up classes to be missed. However, students will still be responsible for lecture material and must complete their scouting work within 48 hrs.

Classroom Behavior:

Policy regarding use of cell phones/pagers/music players/etc.: Cell phones, pagers, music players, etc. will remain OFF during lectures and greenhouse times.

Policy regarding SMOKING: As of August 2014, The University of Arizona is a tobacco-free campus. Prohibited products include cigarettes, e-cigarettes, cigars, pipes bidis, kretiks, hookahs, water pipes or other smokeless tobacco products. It does not apply to nicotine patches, nasal sprays or nicotine gum.

<http://policy.arizona.edu/sites/default/files/Tobacco-Free.pdf>

Policy regarding student views: As below, students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, students must also respect the views of the instructor and other students.

The Arizona Board of Regents' Student Code of Conduct, ABOR Policy 5-308, prohibits threats of physical harm to any member of the University community, including to one's self. See: <http://policy.web.arizona.edu/~policy/threaten.shtml>.

12/1/11: In the wake of the incidents at Penn State, The Arizona Board of Regents reaffirms its commitment to safety on our campuses. Our policies prohibit intimidation, harassment, threats, and acts of violence. All incidents and allegations of violent or threatening conduct must be immediately reported to law enforcement. We are resolved that there will be zero tolerance of abusive and violent conduct at Arizona's Universities.

Non-Discrimination and Anti-Harassment Policy:

The University of Arizona is committed to creating and maintaining an environment free of discrimination. Please see the policy at:

<http://policy.arizona.edu/sites/default/files/Nondiscrimination.pdf>

Special Needs and Accommodations Statement

Students who need special accommodation or services should contact the Disability Resources Center, 1224 East Lowell Street, Tucson, AZ 85721, (520) 621-3268, FAX (520) 621-9423, email: uadrc@email.arizona.edu, <http://drc.arizona.edu/>.

You must register and request that the Center or DRC send me official notification of your accommodations/needs as soon as possible. Please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate. *The need for accommodations must be documented by the appropriate office.*

Course withdrawal policy:

Students must notify the instructor prior to non-attendance in classes and must execute drop or withdrawal procedures: <http://catalog.arizona.edu/policies/984/grade.htm>

Incomplete work policy:

Incomplete grades must be verified with a written agreement between the instructor and student. This agreement will specify the work to be done and a timetable of completion. See the General Catalog link at: <http://catalog.arizona.edu/policies/984/grade.htm>

Student Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. **However, graded work/exercises must be the product of independent effort unless otherwise instructed.** Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog: <http://dos.web.arizona.edu/uapolicies/>.

Confidentiality of Student Records <http://www.registrar.arizona.edu/ferpa/default.htm>

Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.

The Writing Skills Improvement Program (WSIP): offers free professional writing assistance for UA undergraduate and graduate students. Students work one-on-one with staff members (all of whom have Master's or Ph.D. degrees in addition to college teaching experience) on writing for any class, at any stage of the writing process. WSIP also offers free weekly writing workshops open to the entire university community, with no preregistration required. For more information, call 621-5849 or visit the website at <http://wsip.web.arizona.edu>

Class Schedule – Spring 2017
(Schedule subject to change)

Date	Topic	Scout Report Due (end of class period)	Assignment Due
17 Jan	Course policies/procedures; Teaching Greenhouse Tour; Observe current issues; Assign plant section-employ sticky traps; Pest ID and Scouting Procedures for this class		
24 Jan	Pest ID: Arthropod classification, structure, function, reproduction.	#1	
31 Jan	Whiteflies and Aphids	#2	HW 1
7 Feb	Mites: Spider mites, russet mites	#3	HW 2
14 Feb	Plant pathogens – Dr. Barry Pryor, guest speaker (or other)	#4	HW3
21 Feb	Thrips, tomato bug, and others	#5	
28 Feb	Shore flies, fungus gnats and others	#6	HW 4
7 Mar	Midterm Exam. Scout greenhouse	#7	
14 Mar	<i>NO CLASS – Spring Break</i>		
21 Mar	What is a pest? History of pest management; Development of IPM	#8	
28 Mar	IPM principles and methods	#9	HW 5
4 Apr	Biological control and Biopesticides	#10	HW 6
11 Apr	Pesticide Law, Modes of action and resistance management	#11	HW 7
18 Apr	Pesticide Applicator License/ Pest Control Advisor License/ Worker safety	#12	
25 Apr	Control approaches for specific pests, Plant Diseases		
2 May	Plant Diseases and Viruses		
8 May (Monday)	Final Exam – 3:30 – 5:30pm in regular classroom		