

**Insect Pests of Ornamentals and Turf
BSci 497 - Fall 2011**

Instructor: Dr. Paula Shrewsbury

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Office Hours: Tuesdays, 11:00 a.m. to 12:00 p.m. or by appointment

Lectures - Tues. and Thurs. 9:30-10:45 a.m., PLS 1111

Laboratory - Mon. 1-4 p.m., PLS 1161

LECTURE and LAB SCHEDULE

Entomology: Morphology, Physiology, and Development

- Sept. 1 Lecture 1: Course Introduction, Insects
- Sept. 5 *LABOR DAY HOLIDAY (campus closed, no lab)*
- Sept. 6 Lecture 2: Insects

Ecology and Insects, Sustainable Pest Management, Integrated Pest Management (IPM)

- Sept. 8 **Lecture 3: Biodiversity, Ecosystem Services, and Sustainability**
- Sept. 12 *Lab 1: Collections, Diagnostics, Plant Damage Categories and Types*
- Sept. 13 **Lecture 4: Urban Insect Ecology: Why insects and mites outbreak?**
- Sept. 15 **Lecture 5: Urban Insect Ecology: Why insects and mites outbreak?**
- Sept. 19 *Lab 2: Identification of Insects (Orders)*
- Sept. 20 **Lecture 6: Sustainable Pest Management: What can be done?**
- Sept. 22 Lecture 7: **LECTURE EXAM I**
- Sept. 26 *Lab 3: Identification of Insects (larval ID), Field Collecting*
- Sept. 27 Lecture 8: Management Systems, Principles of IPM
- Sept. 29 Lecture 9: Components of an IPM Program
- Oct. 3 *Lab 4: Biological Control Agents, Monitoring Techniques*
- Oct. 4 Lecture 10: Components of an IPM Program
- Oct. 6 Lecture 11: IPM Control Tactics (Cultural, Mechanical, Physical, Genetic)
- Oct. 10 *Lab 5: LAB PRACTICAL I, Field Collecting*
- Oct. 11 Lecture 12: IPM Control Tactics (Biological Control Agents)
- Oct. 13 Lecture 13: IPM Control Tactics (Biological Control Approaches)
- Oct. 17 *Lab 6: Lepidoptera Identification (caterpillars) and damage, Collections*
- Oct. 18 Lecture 14: IPM Control Tactics (Insecticides, Miticides)

- Oct. 20 Lecture 15: **LECTURE EXAM II**
- Oct. 24 *Lab 7: Coleoptera Identification (beetles) and Damage, Collections*
- Oct. 25 Lecture 16: Lepidoptera (caterpillars)

Pests of Woody Ornamentals in Nurseries and Landscapes

- Oct. 27 Lecture 17: Lepidoptera (caterpillars)
- Oct. 31 *Lab 8: Diptera (true flies) & Hymenoptera (sawflies); PARTIAL COLLECTION DUE*
- Nov. 1 Lecture 18: Coleoptera (beetles)
- Nov. 3 Lecture 19: Coleoptera (beetles)
- Nov. 7 *Lab 9: LAB PRACTICAL II, Collections*
- Nov. 8 Lecture 20: Diptera (true flies)
- Nov. 10 Lecture 21: Hymenoptera (sawflies, wood wasps)
- Nov. 14 *Lab 10: Hemiptera Identification (Heteroptera, Auchenorrhyncha) and Damage*
- Nov. 15 Lecture 22: **LECTURE EXAM III**
- Nov. 17 Lecture 23: Hemiptera: Heteroptera (true bugs) and Auchenorrhyncha (hoppers)
- Nov. 21 *Lab 11: Hemiptera Identification (Sternorrhyncha) and Damage, Collections*
- Nov. 22 Lecture 24: Hemiptera: Sternorrhyncha (aphids, scales)
- Nov. 24 *THANKSGIVING HOLIDAY – Mmmm turkey! (campus closed)*
- Nov. 28 *Lab 12: Acari and Thysanura, Greenhouse Pest, Field/ GH Collecting*
- Nov. 29 Lecture 25: Acari and Thysanura

Pests of Greenhouses and Interiorscapes

- Dec. 1 Lecture 26: Greenhouse IPM, Pests (various taxa)

Pests of Turfgrass (lawns, golfcourses, sod farms)

- Dec. 5 *Lab 13: Turf Pest Identification*
- Dec. 6 Lecture 27: Turf IPM, Turf Pests (various taxa)
- Dec. 8 Lecture 28: Turf Pests
- Dec. 12 *Lab 14: LAB PRACTICAL III, Collections*
- Dec. 13 Lecture 29: Turf Pests, **DAMAGE / INSECT COLLECTION DUE (4:00 p.m.)**
- Dec. 16 **FINAL EXAM (Friday 8:00 – 10:00 a.m., PLS 1111)**

Preface

Course Overview: This course provides current information about: (1) the effect of plant management practices on the ecology and community dynamics that effect arthropod populations, (2) the principles and implementation of Integrated Pest Management (IPM) programs, and (3) diagnostics of causal agents of plant damage, and (4) the identification, life history, and management of major insect and mite pests of ornamental plants and turf. The emphasis is on pests of woody ornamentals and turf, while pests of herbaceous and tropical plants are also discussed. These are pests that occur in landscapes, nurseries, Christmas tree farms, greenhouses, interiorscapes, lawns, sod farms, and golf courses.

Course Objectives: Those who master this material will: (1) recognize most of the serious pests of ornamental plants and turf in the eastern United States (site ID to order, family, and common name) and their associated natural enemies, (2) recognize the major damage symptoms caused by arthropod herbivores, (3) be able to diagnose the causal agent damaging plants and turf, (4) understand the life cycle, and monitoring and management strategies for each pest using the principles of IPM as guidelines, and (5) be able to develop sustainable pest management strategies. The laboratory portion of this course provides a hands-on approach that supports the course objectives.

Prerequisites:

A college level understanding of biology is assumed. Knowledge of insects, and ornamental plants or turf would be helpful.

Course Requirements and Grading

Required Text:

Davidson, J.D. and M.J. Raupp. 2009. Managing Insects and Mites of Woody Plants: an IPM Approach. ISBN# 978-0-9843145-0-8. Published by Tree Care Industry Association, Londonderry, N.H. Phone: 603.314.5380, web: tcia.org. This book is directly applicable to this course and should also provide an excellent resource for anyone who works in a field related to plant production and/or maintenance.

Purchasing options:

1. \$30 cost - Go to Plant Sciences room 4112 (M-F between 8:00 a.m. – 4:30 p.m.). You must pay with cash or a check made out to “The University of Maryland”. No credit cards will be accepted.
2. \$40 cost - Go to the TCIA.org web site and order through them at: http://www.treecareindustry.org/PDFs/pandsguide2010_v3_sm.pdf or call 800-733-2622

Required readings:

A small number of readings will be assigned throughout the semester. These will complement or expand the lecture or lab topics. Reading assignments will be posted on the University ELMS / Blackboard System. Materials from these readings will be covered on exams.

Additional teaching materials:

Most lectures will be illustrated with Powerpoint images.

Laboratory instruction will utilize pinned and live specimens, alcohol specimens, herbarium damage samples, and field walks. Additional text resources will be available in lab to assist with lab assignments. Computers can also be made available, or you may bring a laptop. Both lecture and laboratory will be supported by handouts, course text, and web based information.

Teaching materials and web links will be posted on the University ELMS / Blackboard System.

ELMS / Blackboard: <https://elms.umd.edu/webapps/portal/frameset.jsp>

Students are responsible to check Blackboard and print handouts as necessary. If printing is a problem see the instructor.

Non-classroom course correspondence will be through the University ELMS / Blackboard System and/or email. Be sure the email in the ELMS system is the email you regularly check.

Grading:**Points**

3 Lecture exams and 1 final exam	400 points
3 Laboratory practicals	150 points
1 Collection (plant damage and insect)	150 points
Lecture quizzes (best 10)	50 points
Specimen identifications	25 points
Challenge Reports	<u>25 points</u>
 Total points	 800 points

Grade scale

A+	97% and above	C+	77% to 79%
A	93% to 96%	C	73% to 76%
A -	90% to 92%	C-	70% to 72%
B+	87% to 89%	D+	67% to 69%
B	83% to 86%	D	63% to 66%
B-	80% to 82%	D-	60% to 62%
		F	59% or less

Lecture exams

Exams will consist of various types of questions (ex. short answer, not-so-short answer, multiple choice, matching). Exams are NOT cumulative. Missed exams cannot be made up except for a University Excused Absence with appropriate documentation (see below).

Lab practical

Practicals are expected to test your knowledge of insect identification, identifying damage types, and causal agents of plant damage. The practical will consist of a set number of stations and you will be expected to provide the order, family, and common name of insects (site identify without keys), damage types, diagnose causal agents of damage, and to answer questions regarding other topics discussed in lab. Missed practicals cannot be made up except for a University Excused Absence with appropriate documentation (see below).

Lecture quizzes

Each week during lecture students will be given a quiz on the previous week's lecture material. Each quiz is worth 5 points. The best 10 quiz grades (of ~ 14) will be counted. A missed quiz receives a grade of 0/5. Students are allowed 1 absence in which a quiz can be made up with a self-signed note of an acceptable explanation. No other make-up quizzes will be given except for a University Excused Absence with appropriate documentation (see below).

Insect and Plant Damage Collection: A collection of pest insects and mites, natural enemies, and plant damage specimens is required. Collecting equipment will be provided to each student at the beginning of the course. Students who do not return all equipment will NOT receive a grade. Partial Collection due Oct. 31, 2011 (10 insects, 10 mites = 10 bonus points); Complete Collection due Dec. 13, 2011.

Weekly lab specimen identification

Each student will be required to bring ONE specimen to lab each week. The specimens can be insects and / or plant damage. These should be specimens that were collected for the student's Insect and Plant Damage Collection. Specimens must be correctly identified by the end of the lab period to receive credit. A form to record relevant information will be provided. Each correctly identified specimen is worth 2.5 points. Best 10 grades will be counted (= 25 points total).

Challenge Reports (25 points)

Topics will be selected. Students will work in teams and provide a brief report on varying perspectives of the topic as they relate to sustainability and pest management. Students who are absent on report day will receive 0/5 points. Students are allowed 1 absence in which a report can be made up with a self-signed note of an acceptable explanation. No other make-up reports will be allowed except for a University Excused Absence with appropriate documentation provided (see below). (5 reports @ 5 points each)

Basic Course Policies

Special needs

It is the student's responsibility to inform the instructor of any special circumstances or needs required by the student. Please inform the instructor in the first week of class. (ex. learning disabilities, religious holidays in conflict with any major course events)

Attendance

Lecture: Regular attendance is expected. Attendance is correlated with class performance.

Lab: Class participation is a major expectation of lab (ex. hands-on activities, discussion, field walks). Therefore, if more than 3 laboratory sessions are missed your course grade will be reduced 1 letter grade from the final numerical grade you achieved (ex. B to C).

Students are responsible to obtain any materials they missed due to absence.

Absences / Make-up of major course events

Students should make every possible effort to contact the instructor prior to missing any major course event such as lecture exams, quizzes, reports, lab practicals, and any more than 3 missed lab classes. Make-ups of lecture exams and lab practicals not given, and more than 3 absences from lab are not allowed except under circumstances of University approved absences with appropriate documentation. It is the policy of the University to excuse the absences of students that result from the following causes: illness of the student, or illness of a dependent as defined by Board of Regents policy on family and medical leave; religious observance (where the nature of the observance prevents the student from being present during the class period); participation in university activities at the request of University authorities; and compelling circumstance beyond the student's control. Students claiming excused absence shall be required to provide his or her instructor with written documentation of the illness from the University Health Center or from his or her own health care provider. The University Health Center or health care provider shall verify dates of treatment and indicate the dates the student was unable to meet academic responsibilities. University policy on make-up exams can be found at:

<http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540>

Late assignments: The penalty for late assignments will be 1 letter grade per day (24 hours).

Conducting non-class related activities such as texting, emailing, face booking, etc. is NOT allowed during lecture or lab. You will be asked to leave class if this is observed. All cell phones should be put away; computers should be used for note-taking and class activities only.

Student Honor Code will be enforced. Cheating, plagiarism, or fabrication will not be tolerated in this course. The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.shc.umd.edu/> and <http://www.studentconduct.umd.edu/>. If not sure – ask the instructor.

Course Evaluations

Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process for faculty. Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations starting in early December. *I am open at anytime to input and constructive criticism that will help me to improve the quality of the course and your learning experience.*