

# Landscape Ornamental Plant Insect and Mite Pests – Identification, Biology and Management Syllabus

Entomology 5609; Spring 2023

## Course Information

- **Course times and location:** No required schedule meetings (asynchronous); all instruction occurs in Carmen each week
- **Credit hours:** 3
- **Mode of delivery:** Distance Learning

## Instructor

- **Name:** Benjamin Philip, Ph.D., Lecturer, Department of Entomology
- **Email:** philip.12@osu.edu
- **Office location:** 257A Howlett Hall
- **Office hours:** held virtually by appointment
- **Preferred means of communication:**
  - My preferred method of communication for questions is **email**.
  - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

## Course Developer

- **Name:** David Shetlar, Ph.D., Professor Emeritus of Urban Landscape Entomology
- **Email:** shetlar.1@osu.edu

## Course Prerequisites

ENTOMOLOGY 1101, 1111, 3000, 4000, or 4600



## Course Description

The purpose of this course is to provide information on the insect and mite groups that attack managed landscape ornamental plants (trees, shrubs, perennials and annuals) so that participants will learn how to diagnose and identify common pests, and be able to select appropriate methods of managing these pests. The insects are presented as examples of groups that have similar habits (i.e., feeding styles and parts of plants attacked) and life cycles. Using this method, when new pests are encountered, these pests can be quickly identified and management approaches can be developed. Management strategies include sampling and monitoring techniques, chemical control techniques (pesticides), non-chemical techniques (biological control, resistance, and cultural/mechanical controls) in an Integrated Pest Management (IPM) approach.

## Learning Outcomes

By the end of this course:

- Students will be able to recognize the common symptoms of insect and mite damage done to landscape ornamentals, and associate specific groups of pests to the damage.
- When a pest group is identified, students will be able to determine the most vulnerable stage in the life cycle that is most susceptible for control.
- Students will be able to use sampling techniques that will determine if pest populations have reached levels that are dangerous to the host plant and require management techniques.
- When pesticides are deemed appropriate, students will be able to select those that are most effective and use them in an environmentally responsible manner.
- Students will be able to recommend non-pesticide options in an IPM approach to manage the major insect and mite pest groups.



# How This Online Course Works

**Mode of delivery:** This course is 100% online. There are no required sessions when you must be logged in to Carmen at a scheduled time.

**Pace of online activities:** This course consists of 42 recorded lecture-style modules with reading assignments and assessments to complete for each module. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

**Credit hours and work expectations:** This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](https://www.osu.edu/credit-hours) ([go.osu.edu/credithours](https://www.osu.edu/credit-hours)), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of [C] average.

**Attendance and participation requirements:** Research shows regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Participating in online activities for attendance: at least once per week**  
You are expected to log in to the course in Carmen every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **Zoom meetings and office hours: optional**  
All live, scheduled events for the course, including my office hours, are optional.

# Course Materials, Fees and Technologies

## Required Materials and/or Technologies

- Cranshaw, W. & D. Shetlar. 2018. Garden Insects of North America, second edition. Princeton University Press, Princeton, NJ (& Oxford, UK). 704pp.
- All modules and presentations, with notes, will be available as PDF files online.

## Useful References

- Baker, W.L. 1972. Eastern Forest Insects. USDA-Forest Service, Misc. Publication #1175. 642pp. (classic book on wide array of forest insects found in eastern North America)
- Hiratsuka, Y., D.W. Langor, & P.E. Crane. 1995. A Field Guide to Forest Insects and Diseases of the Prairie Provinces. Canadian Forestry Service, Northwest Region, Northern Forestry Center, Special Report 3. 297pp. (small paperback with hundreds of color pages of pests and damage)
- Ives, W.G.H. & H.R. Wong. 1988. Tree and Shrub Insects of the Prairie Provinces. Canadian Forestry Service, Northern Forestry Center, Information Report NOR-X-292. 327pp. (hundreds of color pages of pests and damage)
- Johnson, W.T. & H.H. Lyon (& C.S. Koehler & J.A. Weidhass). 1991. Insects That Feed on Trees and Shrubs, second edition. Cornell University Press, Ithaca, NY. 560pp. (extremely useful with hundreds of color pages of pests and damage)
- Leslie, A.R. (Ed.). 1994. Handbook of Integrated Pest Management for Turf and Ornamentals. CRC Press, Boca Raton, FL. 660pp.
- Wagner, D.L. 2005. Caterpillars of Eastern North America. Princeton Field Guides, Princeton University Press, Princeton, NY (& Oxford, UK). 512pp. (extremely useful for identifying wide range of caterpillars that attack trees, shrubs, and perennials)

## Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at [go.osu.edu/student-tech-access](http://go.osu.edu/student-tech-access).

## Required Software

**Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365. Visit the [installing Office 365](http://go.osu.edu/office365help) (go.osu.edu/office365help) help article for full instructions.

## CarmenCanvas Access

You will need to use [BuckeyePass](http://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](http://go.osu.edu/add-device) (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- [Install the Duo Mobile application](http://go.osu.edu/install-duo) (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

## Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](http://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetings](http://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)

## Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat:** [go.osu.edu/it](http://go.osu.edu/it)
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** [servicedesk@osu.edu](mailto:servicedesk@osu.edu)

# Grading and Faculty Response

## How Your Grade is Calculated

Assignment Category	Points
Module Quiz (43 module quizzes x 20 pts. each)	860
Final Exam	100

See [Course Schedule](#) for due dates.

## Descriptions of Major Course Assignments

### Module Quiz

**Description:** Quizzes cover information presented in each module. There are 10 questions for each quiz and 10 minutes in which to take the quiz.

**Academic integrity and collaboration:** These quizzes are open note. However, they are timed and this time limit will require that students prepare in advance to take the quizzes. Students should not work with other students when taking the quizzes.

### Final Exam

**Description:** The final exam is comprehensive and will consist of 50 questions to be completed in 60 minutes.

**Academic integrity and collaboration:** The final exam is open note. However, since it's timed, students should prepare in advance to take the final. Students should not work with other students when taking the final.

## Late Assignments

Please refer to Carmen for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments.

## Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours on days when class is in session at the university**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date may have reduced feedback, and grades may take longer to be posted.

## Grading Scale

93–100: A  
90–92.9: A-  
87–89.9: B+  
83–86.9: B  
80–82.9: B-  
77–79.9: C+  
73–76.9: C  
70–72.9: C-  
67–69.9: D+  
60–66.9: D  
Below 60: E



# Other Course Policies

## Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this online class.

### Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](#) (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

**If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct.** If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](#) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](#) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](#) (go.osu.edu/cardinal-rules)



## Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

## Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at [equity.osu.edu](https://equity.osu.edu),
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or email [equity@osu.edu](mailto:equity@osu.edu)

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.



## Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:6142925766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://suicidepreventionlifeline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:18002738255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.



# Accessibility Accommodations for Students with Disabilities

## Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services.

## Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: [slds.osu.edu](http://slds.osu.edu)
- Email: [slds@osu.edu](mailto:slds@osu.edu)
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

## Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](http://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](http://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

# Course Outline

## Course Outline

### *Introduction:*

**Module 1** – General Entomology Review – Insect Groups and Life Cycles

**Module 2** – Ornamental Plants - Benefits and Usage, Damage Caused by Pests and Risks to Plant Health

**Module 3** – Insect and Mite Groups that Attack Ornamental Plants

### *Foliage-eating Pests:*

**Module 4** – Foliage-eating pest groups and symptoms of damage

**Module 5** – Defoliators & General Feeders – caterpillars & sawflies

**Module 6** – Specialized Feeders – skeletonizers, notchers, hole makers

**Module 7** – Foliage-eaters: Nest Makers – rollers, folders, tiers, casebearers

**Module 8** – Foliage-eaters: Nest Makers – bagworms, webworms, tent makers

**Module 9** – Leafminers – flies/midges, beetles, caterpillars, sawflies

**Module 10** – Flower-eating pests

### *Borers – Eat within stems and trunks*

**Module 11** – Borer damage and symptoms

**Module 12** – Borers: Round-headed & Flat-headed

**Module 13** – Borers: Bark beetles & Ambrosia beetles

**Module 14** – Borers: Weevils, Lizard beetles, Lepidopterous borers - introduction

**Module 15** – Borers: Clearwing borers

**Module 16** – Borers: Clearwing borers cont'd, shoot & tip moths

**Module 17** – Borers: Leopard moths, stalk borers, sawfly & midge borers

### *Root-Attacking Pests*

**Module 18** – Black Vine Weevil & other root weevils, white grubs

### *Sucking Pests*

**Module 19** – Nature of Sucking Pest Attacks – plant distortions, excrement signs

**Module 20** – Plant and Leaf Bugs

**Module 21** – Lace Bugs, Leaf-footed Bugs, Stink Bugs

**Module 22** – Cicadas, Treehoppers, & Spittlebugs

**Module 23** – Leafhoppers & Fulgorid Planthoppers

**Module 24** – Aphids

**Module 25** – Psyllids, Phylloxerans & Adelgids

**Module 26** – Whiteflies & Scale Introduction (life cycles)

**Module 27** – Scales I – Mealybugs, Felt, Gall-like, Pit & False Pit Scales

**Module 28** – Scales II – Soft Scales

**Module 29** – Scales III – Armored Scales

**Module 30** – Thrips

**Module 31** – Mites – Spider Mite Groups

**Module 32** – Mites – Eriophyid Mites, False Spider Mites

### *Galls*

**Module 33** – Galls – Groups

### *Nuisance Pests*

**Module 34** – Nuisance Pests: Stinging, Biting, Building-invading

**Module 35** – Other pests – snails, slugs, mammals

***Insect & Mite Management in Ornamentals***

**Module 36** – Pest Management Approaches – Using Some IPM Principles

**Module 37** – Monitoring Pests: Detection and sampling techniques; Phenology & Degree-days

**Module 38** – Using Cultural Controls: Resistant/tolerant Plants; Water management; Fertility

**Module 39** – Using Biological Controls: Predators, Parasitoids, Pathogens, Bio-based Products

**Module 40** – Chemical Controls: Insecticide and Miticide Modes of Action; Systemicity

**Module 41** – Application Technology: Sprays, Mist Blowers, Drenches, Injections (soil & trunk)

**Module 42** – Pollinator Safety & Butterfly Gardening

<b>Course Schedule</b>			
Refer to the CarmenCanvas course for up-to-date due dates.			
<b>Week #</b>	<b>Week Of:</b>	<b>Modules</b>	<b>Quizzes Due</b>
<b>1</b>	1/9	1a+b, 2	1/11
		3,4	1/13
<b>2</b>	1/16	5	1/18
		6,7	1/20
<b>3</b>	1/23	8	1/25
		9,10	1/27
<b>4</b>	1/30	11	2/1
		12,13	2/3
<b>5</b>	2/6	14	2/8
		15,16	2/10
<b>6</b>	2/13	17	2/15
		18,19	2/17
<b>7</b>	2/20	20	2/22
		21, 22	2/24
<b>8</b>	2/27	23	3/1
		24,25	3/3
<b>9</b>	3/6	26	3/8
		27,28	3/10
<b>10</b>	3/13	<b>SPRING BREAK</b>	

Week #	Week Of:	Modules	Quizzes Due
<b>11</b>	3/20	29	3/22
		30,31	3/24
<b>12</b>	3/27	32	3/29
		33,34	3/31
<b>13</b>	4/3	35	4/5
		36,37	4/7
<b>14</b>	4/10	38	4/12
		39,40	4/14
<b>15</b>	4/17	41	4/19
		42	4/21
<b>Finals</b>	4/26 (W)	<b>FINAL EXAM</b>	<b>FINAL DUE: 4/28</b>

Refer to the CarmenCanvas course for up-to-date due dates.