General Insect Pest Management
Entomology (ENTMLGY) 4601
Autumn semester 2017

Instructors: Dr. Celeste Welty and Dr. Luis Cañas

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Office hours: Thursdays, 9:00-11:00 AM, or by appointment.

Course Description:
An exploration of insect pests that affect crops, landscapes, public health, and domestic animals, and the
biological, cultural, and chemical tactics used to manage them. Content includes: strategies and tactics of
pest management; biological control; chemical control by insecticides; behavioral control; cultural,
 mechanical, physical controls; host plant resistance; regulatory and genetic controls; pest monitoring;
decision making in pest management; combined tactics used in managing medical and veterinary pests,
structural and nuisance pests, pests of grain and forage crops, vegetable and fruit crops, greenhouse
crops, turfgrass, and landscape plants. Pest management tactics emphasized will be those that have
historical value, demonstrate new approaches, or are a proven success.

Pre-requisite: ENTMLGY 4600, or 1011, or 1111, or 4000.

Course Objectives:
1. Students will explain the advantages and disadvantages of a range of pest management tactics
including biological, cultural, mechanical, and chemical approaches.
2. Students will explain how tactics are combined to manage multiple pests in representative ecosystems.
3. Students will describe common methods used for monitoring pests, and explain how monitoring
information is used to make pest management decisions.
4. Students will identify common insects pests and diagnose common pest problems.
5. Students will describe ways to find information about pest identification and management.

Course structure:
Lecture component: The course is offered as a computer-assisted course. The lectures will be delivered
only via computer, and available for viewing by students on a flexible schedule; the lectures will not
be given face-to-face in a classroom at a regularly scheduled time. The topics of 17 lectures are listed in the
syllabus. Students are expected to view one or two lectures (each 30-60 minutes) per week, in the
sequence listed.

Laboratory component: The laboratory sessions will be at the regularly scheduled class meeting time of
one 2-hour class per week, and attendance is mandatory. Several of the labs will involve live insects, and
many will involve observation of preserved insects. Quizzes on topics covered in lab are part of this
component.
Recitation component: We treat part of each lab class as a recitation. The purpose is to provide time for questions and discussion with the instructors, about material covered in both lecture and lab. Exams covering lecture material will also be given during this time.

Computer access requirements:
• Students must have access to the internet to access required course materials posted on Carmen.
• OSU’s Carmen site is an education tool that allows interaction between instructors and students and helps to share information about courses. Carmen can be found at: https://carmen.osu.edu/
• The syllabus, narrated lectures, partial lecture notes, laboratory descriptions and exercises, review materials, lecture quizzes, and other class information for the course are posted on Carmen.
• Students must have BOTH the QuickTime plugin (Apple software) AND the Adobe Flash plugin (Adobe software) installed on their browsers to view the narrated lectures (please check your computer first because most new computers can play the class files already) these are available free from the internet at the following sites: http://www.apple.com/quicktime/download/
  http://www.adobe.com/products/flashplayer/
• Lectures will be available in two ways: 1) in a streaming form, which is accessed more quickly and will take up little space on the student’s computer, but which must be viewed while connected to the internet, and 2) in a downloadable form, which will take a longer time to download and will take up space on the computer, but can be viewed later after the student’s computer is no longer connected to the internet.

Grading:
There will be one mid-term examination, an online quiz after each lecture, lab quizzes, worksheets, laboratory exercises, a project, a laboratory practical examination, and a final examination. The final exam will be comprehensive. Exam questions will be multiple choice, matching, and short answer. Exams will also cover materials from assigned readings. Exams missed for legitimate reasons (illness, snowstorm, etc.) must be made up before the next exam or (in the case of the final) before the end of the third week of the following semester. Point totals are summarized below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Quizzes (N=17, each 10 points)</td>
<td>170</td>
<td>21</td>
</tr>
<tr>
<td>Worksheets &amp; laboratory exercises (N=13, each 20 points)</td>
<td>260</td>
<td>32</td>
</tr>
<tr>
<td>Lab Identification Quizzes (N=3, each 30 points)</td>
<td>90</td>
<td>11</td>
</tr>
<tr>
<td>Project: fact finding on one economic pest</td>
<td>50</td>
<td>6</td>
</tr>
<tr>
<td>Midterm examination</td>
<td>100</td>
<td>12</td>
</tr>
<tr>
<td>Laboratory practical examination</td>
<td>50</td>
<td>6</td>
</tr>
<tr>
<td>Final examination</td>
<td>100</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>820</td>
<td>100</td>
</tr>
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</table>

Grades will be assigned according to the following scale:

<table>
<thead>
<tr>
<th>Percentage range</th>
<th>Point range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93</td>
<td>100.0</td>
<td>763</td>
</tr>
<tr>
<td>90</td>
<td>92.9</td>
<td>738</td>
</tr>
<tr>
<td>87</td>
<td>89.9</td>
<td>713</td>
</tr>
<tr>
<td>83</td>
<td>86.9</td>
<td>681</td>
</tr>
<tr>
<td>80</td>
<td>82.9</td>
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<tr>
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<td>79.9</td>
<td>631</td>
</tr>
<tr>
<td>73</td>
<td>76.9</td>
<td>599</td>
</tr>
<tr>
<td>70</td>
<td>72.9</td>
<td>574</td>
</tr>
<tr>
<td>67</td>
<td>69.9</td>
<td>549</td>
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<tr>
<td>60</td>
<td>66.9</td>
<td>492</td>
</tr>
<tr>
<td>0</td>
<td>59.9</td>
<td>0</td>
</tr>
</tbody>
</table>
**Project:** Each student will assemble information about one economically important pest after investigating its biology and management methods, using library and internet resources. The project is due in the last week of the semester. Detailed instructions will be provided during the first class.

**Summary of Due Dates for Worksheets, autumn 2017:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date initiated</th>
<th>Date due (3 PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag stats &amp; crop profiles worksheet</td>
<td>8/24</td>
<td>8/31</td>
</tr>
<tr>
<td>Journal articles worksheet</td>
<td>8/24</td>
<td>8/31</td>
</tr>
<tr>
<td>Insecticide toxicity worksheet</td>
<td>9/14</td>
<td>9/21</td>
</tr>
<tr>
<td>Insecticide labels worksheet</td>
<td>9/14</td>
<td>9/21</td>
</tr>
<tr>
<td>Lacewing predation exercise</td>
<td>9/14 &amp; 9/28</td>
<td>10/5</td>
</tr>
<tr>
<td>Pest trap trends worksheet</td>
<td>9/28</td>
<td>10/5</td>
</tr>
<tr>
<td>Thresholds worksheet</td>
<td>10/5</td>
<td>10/19</td>
</tr>
<tr>
<td>Insecticide bioassay exercise</td>
<td>10/19 &amp; 10/20</td>
<td>10/26</td>
</tr>
<tr>
<td>Parasitoid exercise</td>
<td>10/26</td>
<td>11/2</td>
</tr>
<tr>
<td>Sprayer calibration exercise</td>
<td>11/9</td>
<td>11/16</td>
</tr>
<tr>
<td>Insecticide rate calculations worksheet</td>
<td>11/9</td>
<td>11/16</td>
</tr>
<tr>
<td>Greenhouse scouting and trapping exercise</td>
<td>11/9 &amp; 11/16</td>
<td>11/30</td>
</tr>
<tr>
<td>Natural enemy release</td>
<td>11/16 &amp; 11/30</td>
<td>12/7</td>
</tr>
</tbody>
</table>

**Instructional materials:**
A pre-printed course packet with both lab and lecture material will be available for purchase; however, students have the option of printing each lab exercise in advance, instead of purchasing the packet. The packet is about 300 pages, color print, and cost is about $40.

**Readings:**
A list of 19 required articles and 42 optional articles is posted on Carmen during the first week of class. All required articles are available on-line.

**Textbook:**
Radcliffe's IPM World Textbook (on-line): [https://ipmworld.umn.edu/](https://ipmworld.umn.edu/)
The textbook is on-line and includes some of the required readings and some of the optional readings.

**Other reference books (optional):**
General policies for this course:
Attendance policy:
Attendance in lab class every week is mandatory.

Late assignments policy:
A report that is handed in late will be reduced in value 10 percent per day that it is late.

Incomplete grade policy:
Incomplete grades will be given only in special circumstances as outlined in university policy.

http://trustees.osu.edu/rules/university-rules/chapter-3335-8-instruction.html

General policies at Ohio State University
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 (http://studentlife.osu.edu/csc/), 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 in 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 we (the instructors) suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our 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 us.

Other sources of information on academic misconduct (integrity) to which you can refer include:
- The Committee on Academic Misconduct web pages (COAM Home)
- Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.htm)

Disability services: Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu; slds.osu.edu.

General information: Additional information on general Ohio State University Policies can be found at:
http://trustees.osu.edu/university/facultyrules
General Insect Pest Management (ENTMLGY 4601), autumn 2017, schedule of topics:

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Lab topic (in class, Thursdays 3:00 – 4:50 PM)</th>
<th>Lecture topic (Recorded lectures posted on Carmen)</th>
<th>Deadline for on-line lecture quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/24</td>
<td>Lab 1: Review identification of arthropod classes and insect orders</td>
<td>1) Introduction to insect pest management (&amp; Worksheet on ag stats &amp; crop profiles, &amp; Worksheet on journal articles)</td>
<td>8/30, Wedn., 11:59 PM</td>
</tr>
</tbody>
</table>
| 2     | 8/31        | Lab 2: Identification of immature insects  
Lab 3: Identification of natural enemies                        | 2) Cultural, mechanical, & physical controls                                                                   | 9/6, Wedn., 11:59 PM             |
| 3     | 9/7         | Lab 4: Identification of grain & forage crop pests                                                        | 3) Biological control  
4) Behavioral control                                                                                               | TWO, both 9/13, Wedn., 11:59 PM  |
| 4     | 9/14        | Lab 5A: Lacewing predation exercise, part 1: count eggs  
Lab 6: Identification of medical & veterinary pests (w/ demo of live mosquitoes) | 5) Chemical control by insecticides (& Worksheet on toxicity, & Worksheet insecticide labels)             | 9/20, Wedn., 11:59 PM           |
| 5     | 9/21        | Identification quiz #1 (labs 3, 4, 6)  
Lab 7: Identification of vegetable crop pests  
Lab 8: Identification of turfgrass pests                          | 6) Host plant resistance  
7) Regulatory and genetic controls & eradication                                                                   | TWO, both 9/27, Wedn., 11:59 PM  |
| 6     | 9/28        | Lab 5B: Lacewing predation exercise  
Lab 9: Identification of tree pests                                    | 8) Insect pest monitoring (& Worksheet on trap trends)                                                          | 10/4, Wedn., 11:59 PM           |
| 7     | 10/5        | MID-TERM EXAM (lectures #1-7)  
Lab 10: Identification of structural & nuisance pests, w/ termite pheromone demonstration | 9) Decision making in pest management (& Worksheet on thresholds)                                               | 10/18, Wedn., 11:59 PM         |

AUTUMN BREAK: Thursday 10/12 & Friday 10/13

| 8     | 10/19       | Lab 11A: Insecticide bioassay exercise                                                                      | 10) Managing pests of grain & forage crops                                                                      | 10/25, Wedn., 11:59 PM          |
| 8B    | 10/20       | Lab 11B: Finish insecticide bioassay exercise (1 member per group)                                           | -                                                                                                               | -                               |

| 9     | 10/26       | Identification quiz #2 (labs 7, 8, 9, 10)  
Lab 12: Identification of greenhouse pests  
Lab 13: Parasitoid exercise                        | 11) Managing pests of vegetable & fruit crops  
12) Pest management in organic systems             | TWO, both 11/1, Wedn., 11:59 PM                   |

| 10    | 11/2        | Lab 14: Identification of fruit crop pests  
Lab 15: Identification of stored product pests                                      | 13) Managing pests of greenhouses  
14) Managing pests of urban ornamental plants & turfgrass                                           | TWO, both 11/8, Wedn., 11:59 PM |

| 11    | 11/9        | Lab 16A: Position traps for sampling exercise in greenhouse  
Lab 17: Sprayer calibration exercise, in greenhouse (& Worksheet on rate calculations) | 15) Managing termites in structures  | 11/15, Wedn., 11:59 PM          |

| 12    | 11/16       | Identification quiz #3 (labs 12, 14, 15)  
Lab 16B: Scouting & trapping exercise in greenhouse, part 2  

THANKSGIVING BREAK: Wednesday 11/22 to Friday 11/24

| 13    | 11/30       | Lab 18B: Natural enemy release, part 2  
LAB PRACTICAL EXAM (Identification from labs 3, 4, 6, 7, 8, 9, 10, 12, 14, 15) | 17) The future of pest management                                                              | 12/6, Wedn., 11:59 PM          |

Final exam: Tuesday, 12/12/2017, 4:00 – 5:45 PM.