

LAND ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) First Nation. To learn more about the Musqueam First Nation, please visit: <https://www.musqueam.bc.ca/our-story/>.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Insects in Agroecosystems	APBI 463 002	3

PREREQUISITES:

LFS 252 or equivalent for undergraduate students enrolled in the course. APBI 327 or BIOL 327 suggested.

COREQUISITES:

none

CONTACTS

Course Instructor(s)	Contact Details	Office Location	Office Hours
Dr. Juli Carrillo	Email: juli.carrillo@ubc.ca	MCML 333	Tuesdays 11:00-12:00; sign-up in advance through Canvas

Course Teaching Assistant	Contact Details	Office Location	Office Hours
Hannah Anderson	Email: hannaha0@mail.ubc.ca	Virtual office hours	Wednesdays 1-2pm; sign-up in advance through Canvas

COURSE DESCRIPTION AND STRUCTURE

Course Overview:

APBI 463 002 Insects in Agroecosystems

Agroecosystems are some of the most important ecosystems on earth, not only because of their primary role in the creation of food, fiber, and fuel, but also because of their outsized role in resource requirements and contributions to climate change, habitat modification, and biodiversity loss. Insects both contribute to the positive aspects of agroecosystems (e.g. pollination services and ecosystem functioning), but also are associated with massive chemical inputs because of management to control insect pests and their detrimental effects. This course will examine the various types of insects present in agroecosystems, their ecology and evolutionary biology, and the impacts of insects on ecosystem function and ecosystem services. Using current research and case studies, improved sustainability of insect management within agroecosystems will be explored.

Course location and structure:

The course meets in person T/TH and consists of a combination of lectures, interactive class discussions, seminars from experts in the field, and critical analysis of current research, case studies, and scientific literature.

SCHEDULE OF TOPICS

The following table provides the schedule for the class and might be adjusted. Please see the Canvas **COURSE SCHEDULE** on the Canvas course homepage for more detail on each day's activities and assignment due dates.

Session/Time	Topic and Activity
Week 1	Introduction, Course structure, Insects and Plants
Tuesday	<i>Lecture:</i> What are agroecosystems and why should we care
Thursday	<i>Lecture:</i> The world of agro-entomology: past, present, and future (i.e. career prospects)
Week 2	Pests insects
Tuesday	<i>Lecture:</i> Insect feeding guilds, pest ecology
Thursday	<i>Lecture:</i> Emergent pest threats
Week 3 Tuesday	Pollinators
	<i>Lecture:</i> Honey bees and other managed pollinators

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Thursday	<i>Lecture:</i> The role of wild pollinators
Week 4	Plants and Microbes
Tuesday	<i>Lecture:</i> Chemical ecology of plant-insect interactions, effects of crop domestication
Thursday	<i>Lecture:</i> Role of microbes in crop-insect interactions
Week 5	Natural Enemies
Tuesday	<i>Lecture:</i> The enemy of my enemy is my friend: Multi-trophic interactions for pest management
Thursday	Introduction to the group research proposal
Week 6 Tuesday	Natural Enemies continued, AAFC Week
	<i>Lecture:</i> Bio-surveillance of pest insects and their natural enemies
Thursday	<i>Lecture:</i> Biological control in agro-ecosystems
Week 7	Reading Week
Tuesday	No class
Thursday	No class
Week 8 Tuesday	Ecosystem Functioning
	<i>Lecture:</i> Decomposers, Nutrient cycling, Crop residue management, Integrated cropping systems

Thursday	Research presentations and group work time
Week 9	Effects of Management Practices
Tuesday	<i>Lecture:</i> Cropping systems (intercropping, monocultures), till versus no-till, agro-chemicals, horticultural practices
Thursday	Final Group Research Proposal Work Session
Week 10 Tuesday	Extension and Outreach
	<i>Lecture:</i> The role of extension and outreach, science communication
Thursday	<i>Lecture:</i> Introduction to the Case Study, Delta Farmland and Wildlife Trust
Week 11	Case Study: Delta Farmland and Wildlife Trust
Tuesday	<i>Lecture:</i> Research Presentations: Delta Farmland and Wildlife Trust Research Team
Thursday	Farm Field Trip
Week 12	Case study continued: Managing for Biodiversity
Tuesday	<i>Lecture:</i> Evaluating biodiversity impacts
Thursday	Case study analysis and class discussion
Week 13	Extension and Outreach Continued
Tuesday	<i>Lecture:</i> The art of science communication
Thursday	Work session tutorial

Week 14	Insect Showcase
Tuesday	Insect Biographies and Extension Documents
Thursday	Insect Biographies and Extension Documents

LEARNING OUTCOMES

Upon completion of this course, students will be able to:

1. Classify the different types of insects present in agroecosystems by function and effects
2. Identify the effects of different management practices on natural and managed insect populations.
3. Identify ecosystem services provided by different types of insects in agroecosystems.
4. Recognize sources of conflict in managing beneficial and detrimental insects within agroecosystems.
5. Determine selective, evolutionary pressures on insect populations in agroecosystems.
6. Develop competency in designing experiments and research proposals to evaluate the effects of management practices on insects
7. Describe and classify current methodologies in insect monitoring
8. Critically evaluate scientific literature
9. Create effective science communication materials

Learning Activities

Students are expected to participate in class, through asking questions of the instructor and their peers, and through engaging in classroom and online discussions. Students are expected to complete both individual and group-based assignments, including oral presentations to the class, a group research proposal, reflective writing, and an insect biography that will be used as a science communication outreach and extension document. Some class time will be set aside for collaborative work on assignments. Additional, self-guided group work and individual work will occur outside of class.

LEARNING MATERIALS

Students will need access to the internet to perform scientific literature reviews, e.g. through UBC Library access. Students may request computer access if they do not have their own.

ASSESSMENTS OF LEARNING

Students, and their achievement of stated learning outcomes, will be assessed by several ways, including through an oral class presentation (individual assignment, worth 10% of the final grade), three short reflection essays (individual assignments, each worth 10% of the final grade), a research proposal (group assignment, worth 20% of the final grade), a Case Study analysis (individual assignment, worth 15% of the final grade), and Insect Biography (individual assignment, worth 15% of the final grade). Ten percent for participation will be calculated from a variety of in class and online activities.

Oral Presentation: (10%)

Use the UBC Library, Web of Science, Google Scholar, or other academic search engine to find a current (<5 yrs since time of publication) research paper that focuses on insects in agroecosystems. Make a power point or other digital presentation of no longer than 5 minutes to present the title and purpose of the paper's described research, the evidence supporting the author's conclusions, a short personal reflection, and future directions. Upload the presentation to Canvas before the start of the last class period. Students will be assessed on the quality of the paper chosen and the quality of the presentation, including the visual elements, oral presentation, and facilitation of class discussion.

Short Personal Reflection Essays: (three total, 10% each)

1 page (12 point font, double-spaced, 1-inch margins) personal reflection on week's topic. The personal reflection is relevant to that week's course materials activities. Makes clear connections to previous knowledge and relationships to current course material. Reflective writing guidelines are detailed within the rubric on Canvas, and reflection statements will be assessed on appropriateness of the personal reflection for the specific topic of the week and associated learning outcomes and on writing quality (e.g. writing should be free of grammatical and spelling mistakes).

Group Research Proposal (20%)

As a group (~3-4 students), develop a research proposal to address an outstanding question in agricultural entomology. Draw on the relevant scientific literature (include a minimum of 5-references). Additional details on Canvas and to be discussed in class.

Insect Bio (15%)

Prepare an extension and outreach document (e.g. one-page handout, brochure, card) or other outreach material (e.g. audio/visual, interactive game) to effectively communicate information to your chosen audience (e.g. children, high school students, farmers, general public, etc) about an insect found within agroecosystems. More details will be provided on Canvas and in class.

Case Study Analysis (15%)

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Students will answer a series of questions about the Case Study, drawing on the materials provided by the research team and in previous class lectures and discussion. Additional details on Canvas and to be discussed in class.

Participation (10%)

Various in class and discussion board activities.

TOTAL possible points (100). Final grades will be based on the evaluations listed above and the final grade will be assigned according to the standardized grading system outlined in the UBC Calendar.

Any changes to the assessment plan will be discussed and communicated in class and through an announcement on Canvas.

Students may request a regrade up to one week after assignments are returned. Regrade requests should be submitted through email and must clearly state the reason for the regrade request, with supporting documentation as necessary.

Late policy: Assignments submitted after the due date/time are considered late. Late assignments will be graded if submitted within one-week of the due date, with 10% off for each day late.

Students can submit one assignment late without penalty, if submitted within 24 hours of the assignment due date/time.

Missed in-class assessments can be made up only if/when class time permits. However, this will not be possible for some in-class assignments (e.g. oral presentations given on the last day of class).

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on [the UBC Senate website](#).

OTHER COURSE POLICIES

The course atmosphere is one of mutual respect, and supportive of a diverse, inclusive, and equitable environment.

Pronouns can be communicated to the course instructor in person, via email, or through Canvas. Additional information on pronouns can be found on the website of the [Equity and Inclusion Office](#).

LEARNING ANALYTICS

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas. Canvas captures data about your activity and provides information that can be used to improve the quality of teaching and learning. In this course, I may use analytics data to:

- Review statistics on course content being accessed to support improvements in the course

I will not use analytics data to assess participation in the course.

LEARNING RESOURCES

Additional learning resources are available through [Student Services](#).

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Students are not permitted to record classes.

This syllabus was made using the UBC Syllabus Template from <https://wiki.ubc.ca>, including specific text from the template, Version: August 27, 2019.