**2022-2023 BIOL411/APBI 427 Syllabus**

**Class location:** Biological Sciences Rm 1012

**Class time:** MWF, 11-11:50;

**Instructor:** Michelle Tseng, tsengm@mail.ubc.ca, Office hours: Fridays 12-1 or by appt

**Teaching Assistant:** Markus Thormeyer thormeyer@zoology.ubc.ca

*This course will cover:*

Population and community ecology, plant-insect interactions, insect biodiversity, responses to climate change, disease transmission, pollination, conservation, and more.

*Students will learn by:*

Attending lectures, participating in class discussions, reading primary literature, studying for the midterm exam, conducting independent research (collecting data, analyzing data, writing up the paper in manuscript format), writing a report to the Government of Canada

*Transferrable skills:*

Scientific writing, statistical analysis in R, knowledge of the most recent advances in insect ecology, broad understanding of key invasive insects, disease vectors, and beneficial insects; ability to understand and critique primary literature

*Assessment: See Syllabus page 3 for details*

10% Paper reading questions, weekly

25% Midterm exam, Friday Feb 17, 2023, in class

25% Monarch project: Should Monarchs be classified as Endangered in Canada?

40% Tree insects project: Urban trees and insect diversity

10% Final take-home assignment, due Friday April 21, 2023

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*Land Acknowledgement*

Much of our learning and discovering is conducted at UBC, which is located on the traditional, unceded, and ancestral territory of the Musqueam. Vancouver, BC is located on the traditional, ancestral, and unceded territories of the Musqueam, Tsleil-Waututh, and Squamish. We recognize that Indigenous peoples have endured hundreds of years of mistreatment, oppression, and systemic racism. Although this class focuses mainly on western scientific methods, we recognize and respect that there are many different ways of understanding the natural world.

*Equity, Diversity, and Inclusion*

Educate yourself about equity, privilege, about the barriers you or others face in academia, and about what can be done to make science a more welcoming field for all. Racism, sexism, homophobia, transphobia, and other types of discrimination are not welcome here.

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**Schedule**

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| **Dates** | **Topic** | **Notes** |
| Jan 9 Jan 11  Jan 13 | Course overview  Reading 1 – Leather 2015, General insect importance  General insect ecology | Pre-course survey ([link](https://ubc.ca1.qualtrics.com/jfe/form/SV_7U7iYpKeDeapl0a)) |
| Jan 16  Jan 18  Jan 20 | Monarch butterfly ecology  Reading 2 – COSEWIC Monarchs  Monarch report: What information do we need? |  |
| Jan 23 Jan 25  Jan 27 | Insect Populations  Reading 3 – Monarchs: Agrawal and Inamine 2018  Monarch report: Read sources and collate information |  |
| Jan 30 Feb 1  Feb 3 | Insect responses to climate change – pt 1  Reading 4 – Monarchs: Zylstra et al 2022  Monarch report: outline and key points done | M&M will check outline |
| Feb 6  Feb 8  Feb 10 | Insect responses to climate change – pt 2  Reading 5 – Tree insects: Tallamy et al 2021  Monarch report: mini presentations | Monarch report due by 9pm |
| Feb 13 Feb 15  Feb 17 | Pollinator ecology  Review & Monarch report class synthesis  Midterm Exam | Mid-term survey |
| Feb 27 Mar 1  Mar 3 | Disease vectors  Reading 6 – Tree insects: Southwood 1961  Tree insects project – Data collection |  |
| Mar 6 Mar 8  Mar 10 | Invasives and Agricultural pests  Reading 7 – Tree insects: Padovani et al 2020  Tree insects project – Research Question generation | Tree insects data file due 9pm |
| Mar 13 Mar 15  Mar 17 | Invasives and Agricultural pests  Reading 8 – Tree insects: Mata et al 2021  Tree insects project – Analysis and results |  |
| Mar 20 Mar 22  Mar 24 | Tree insects project – Analysis and results  Reading 9 – Tree insects: Kjellerberg Jensen et al 2022  Tree insects project – Intro, Methods & Discussion | Michelle & Markus check in  Michelle & Markus check in |
| Mar 27 Mar 29  Mar 31 | Insects and plastic pollution  Reading 10 – Tree Insects: Warren et al 2021  Tree insects project – report & presentation prep | Tree insects: Final version due 9pm |
| Apr 3  Apr 5  Apr 7 | Group Presentations & Course/TA evaluations  Group Presentations  Group Presentations |  |
| Apr 10 Apr 12  Apr 21 | Group Presentations  Group Presentations  Final take-home assignment due Friday Apr 21 |  |

**Assessment Details**

Paper Readings (10)

* 10 readings, each worth 1 point
* Read the paper before Wednesday class. Warning some of them are LONG, so give yourself ample time;
* During Wednesday class, work solo or in groups to answer questions on Canvas;
* Submit your answers on Canvas by 11:30am;
* Full points awarded if you answer all of the questions. No points taken away for incorrect answers.
* You can do the questions at home too if you’d like but we encourage you to come so that you can discuss any questions you have with your peers and/or instructors;
* We will go through the answers & any discussion between 11:30-11:50am.

Midterm Exam (25) - Individual

* Friday Feb 17, 2023 (Friday before Reading Break – please don’t plan any travel for this day)
* Open book, in class, series of short-answer questions, on Canvas (probably)

Monarch Project (25) - Individual or Group, Due February 10, 2023

* 3-page single-spaced report arguing whether or not monarch butterflies should be classified as Endangered in Canada;
* Background information and papers/sources are provided; students can find additional sources if they wish to;
* Individual or group project; rubric to come;
* Joint-class report will be submitted to Environment and Climate Change Canada as part of their call for public consultation on this issue (link to ECCC [site](https://www.canada.ca/en/environment-climate-change/news/2022/11/government-of-canada-launches-consultations-on-the-assessment-of-the-status-of-the-monarch-and-the-western-bumble-bee.html))

Tree Insects Project (40) – Groups of 3

Using the City of Vancouver Tree Database, we will classify the trees in the database as ‘native’ or ‘non-native’. We will use published literature and existing online databases to collate all known insects associated with these different tree species (~360 species). Working in groups, students will develop research questions that can be addressed using the full tree-insect dataset, address these questions using R stats, generate figures in R, and write paper in ‘manuscript’ format. Students will present their findings to the class.

5 Data file; trees classified as native/non-native and insects added, Due Friday March 10, 2023

5 Results section, Due Monday March 20, 2023

20 Final version, Due Friday March 31, 2023

10 Ten-minute presentation, last two weeks of class

Final take-home assignment (10) – Individual

Series of short and long-answer questions based on course material only

Due Friday April 21, 2023