

Upward Bound – Pollinator Biology

Course Instructor: Briana Ezray
bde125@psu.edu

Course Description:

This course will be a foundation course covering major biological and life science concepts through the study of bees and other pollinators. The primary topics covered in this course will be ecology, biodiversity, conservation biology, systematics, molecular biology, genetics, epidemiology, and social behavior. Topics will be covered weekly with lectures and laboratory/field research experience. These experiences will reinforce the concepts discussed in the lecture and provide real world examples, inspiration in regards to the topic area, as well as promote scientific curiosity. Furthermore, in addition to the biological concepts, this course will provide you with the following skills: experimental design, molecular approaches, independent thinking, and scientific literature comprehension.

Week	Day	Topics Covered and Activity Description
<p style="text-align: center;">Week 1 Importance of Pollinators and Scientific Inquiry</p>	<p>Monday 6/11/18</p> <p><i>Instructor: Briana Ezray</i></p>	<p>Introductions</p> <ul style="list-style-type: none"> • Ice Breaker Event • Pollinator Experience Stories <p>Pre-assessment</p> <p>Scientific Method and Graphical Interpretation Lecture and Activity</p> <p>HW: Read Campbell Biology Ch. 1 (Provided by instructor) – Due Date: Thursday 6/14/18</p>
	<p>Tuesday 6/12/18</p> <p><i>Instructor: Dr. Margarita Lopez-Uribe</i></p>	<p>Lecture and Activities: The Importance of pollinators and bees</p> <p>HW: Scientific Method Homework Worksheet</p> <ul style="list-style-type: none"> • Due Date: Friday 6/15/18

***This material was created under GNE16-118 which was supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program.

	Thursday 6/14/18 <i>Instructor: Briana Ezray</i>	Vanishing of the bees documentary
	Friday 6/15/18 <i>Instructor: Briana Ezray</i>	Scientific Method and Graphical Interpretation Activity Cont. Honey Bee Observation Hive <ul style="list-style-type: none"> • Display different honey bee behaviors • Be a naturalist and observe 3 distinct behaviors <i>HW:</i> Honey Bee Naturalist Essays – Due Date: Friday 6/22/18
Week 2 Insect Biodiversity and Evolution	Monday 6/18/18 <i>Instructor: Dr. Heather Hines</i>	Introduction to Pollinator Biodiversity <ul style="list-style-type: none"> • Diversity of insects • How to collect and curate insects Arboretum Field Trip
	Tuesday 6/19/18 <i>Instructor: Dr. Heather Hines</i>	Insect biodiversity Visit to the Frost Entomological Museum
	Thursday 6/21/18 <i>Instructors: Dr. Andy Deans and Dr. Heather Hines</i>	Curation of insects and the importance of museums
	Friday 6/22/18 <i>Instructors: Dr. Heather Hines and Dr. Lee Tian</i>	Mimicry and natural selection End of week perspective/quiz
Week 3 Molecular Biology: Infectious disease dynamics in pollinators	Monday 6/25/18 <i>Instructor: Briana Ezray</i>	Lecture and Activity: Epidemiology and pollinator pathogens

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	<p>Tuesday 6/26/18</p> <p><i>Instructors: Briana Ezray and Dr. Lee Tian</i></p>	Lecture and Activity: Molecular techniques
	<p>Thursday 6/28/18</p> <p><i>Instructor: Briana Ezray</i></p> <p>Attire: Wear long pants and closed toe shoes!</p>	Laboratory Activity: PCR - screen of pathogens in different insects
	<p>Friday 6/19/18</p> <p><i>Instructor: Briana Ezray</i></p> <p>Attire: Wear long pants and closed toe shoes!</p>	Laboratory Activity: Gel electrophoresis – screen of pathogens in different insects Discussion of results HW: Laboratory Write-Up – Due Date: Monday 7/9/18
<p>Week 4 Pollinator Social Behavior and Chemical Ecology</p>	<p>Monday 7/2/18</p> <p><i>Instructor: Dr. Etya Amsalem</i></p> <p>Attire: Wear long pants and closed toe shoes!</p>	Lecture and Lab Activity
	<p>Tuesday 7/3/18</p> <p><i>Instructor: Dr. Etya Amsalem</i></p> <p>Attire: Wear long pants and closed toe shoes!</p>	Lecture and Lab Activity HW: Pick a flower from home wrap in a moist paper towel – Due Date: Monday 7/9/18
<p>Week 5 Ecology of Pollinators</p>	<p>Monday 7/9/18</p> <p><i>Instructor: Emily Erickson</i></p>	Plant-pollinator interactions and co-evolution lecture Activity: Nectar sugar content and reflectance of student's flowers
	<p>Tuesday 7/10/18</p> <p><i>Instructor: Emily Erickson</i></p>	Visit to the Pennsylvania State University Russell E. Larson Research Farm to

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		observe how plant-pollinator interaction experiments are done
	Thursday 7/12/18 <i>Instructor: Briana Ezray</i>	Post-assessment Review of course

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