

BIOL 204 ENTOMOLOGY

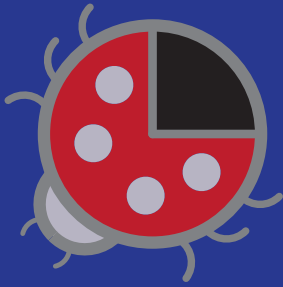
Fall 2023

Lecture: TR 9:45-11AM in MBH 148

Lab: WR 1:30-4:15PM in MBH 235

COURSE OVERVIEW

Why Insects?



Insects are the most successful animal group on the planet, accounting for roughly 75% of all animal species.



Insects can have both beneficial or detrimental impacts on human life in areas such as agricultural and global health.

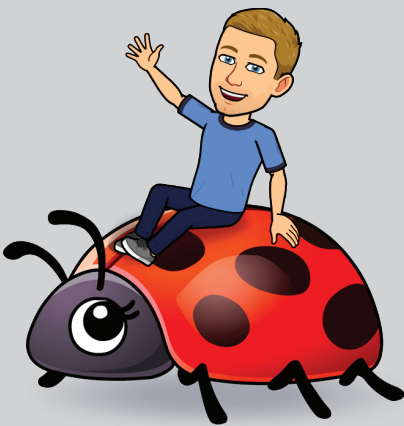
Course Focus

An integrative course using the model of insects to compare aspects of organismal biology such as comparative anatomy, physiology, reproduction, development, sensory behavior, and evolution.



The laboratory component will consist of field experiences, interactions with community members, and insect pest management research at the lab bench.

INSTRUCTOR INFO



Professor: Greg Pask, Ph.D.

Please call me: Greg or Dr./Prof. Pask (he/him)

Ask me about: Anything related to the course, any insect identifications now and in the future, navigating your major, getting started in research, graduate school or other future plans, being a Division III athlete, outdoor spaces in VT, board games, the Marvel Universe, cooking and building/creating fun stuff.

Preferred Contact: Direct message through our Slack workspace

Office Hours: TR 11AM-12:30PM, or by appointment

Office: MBH 315

Email: gpask@middlebury.edu

COURSE MATERIALS

Slack Workspace: biol204f23.slack.com for all course-related business

Textbook: Sverdrup-Thygeson, Anne. *Extraordinary Insects*: ISBN: 978-0008316372

Primary Literature: Papers provided through Slack

LEARNING OUTCOMES

At the completion of this course, students will be able to:

Integrate different aspects of organismal biology across diverse insect taxa to understand molecular/cellular biology, physiology, behavior, ecology, and evolution.

Evaluate and interpret data from both classical and modern research in insect biology and design novel experiments to move the field forward.

Develop curiosity in the insect world and communicate their understanding to both expert and non-expert audiences.

HOW YOU'LL PROGRESS TOWARD THESE GOALS:



Reading and Reflections



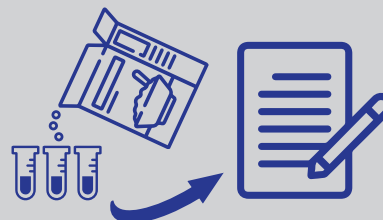
In-Class Discussion Questions



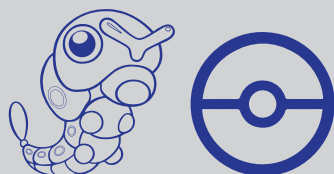
Take-Home Problem Sets



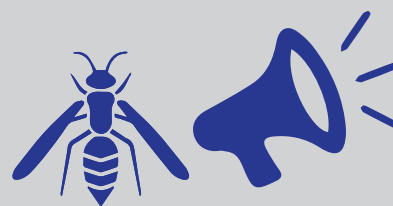
Field Observations and Fabre Focus



Pest Management
GMO Food Lab



Cosplay for Science Outreach Project

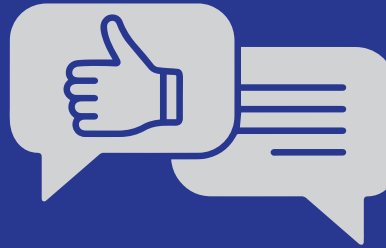


Insect Research SciComm

HOW I WILL ASSESS YOUR PROGRESS

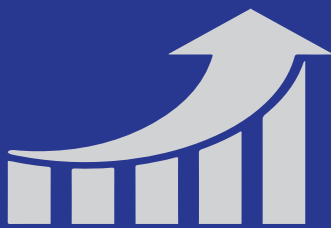
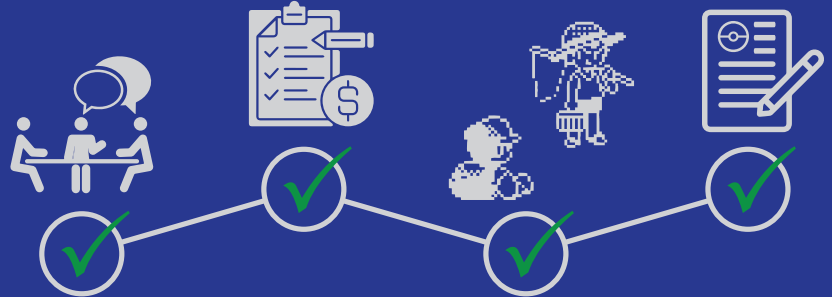
This course will use a labor-based grading approach that centers on feedback, improvement, integrative thinking, idea development, and effective communication. I strongly believe that traditional assessment practices focus too much on “the grade” and can increase stress and/or decrease risk-taking. Instead, your grade will be based on all the work (learning) you’ll be doing this semester.

If you put in significant effort into an assignment and submit it on time, you get full credit for your work.



Critical feedback is given frequently with a focus on self-improvement.

Larger assignments will involve multiple stages of work spread throughout the semester, and all this effort counts!



In class we will discuss the expected level of effort required for your work. If the effort on assigned work is insufficient, you will zero credit and we will then work to figure out the best practices to optimize your labor-based learning.

EXPECTATIONS:

BE ENGAGED



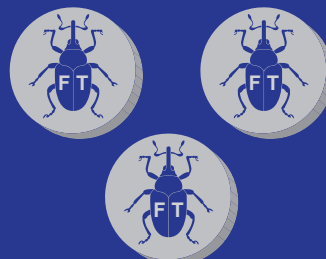
BE CURIOUS



WORK HARD

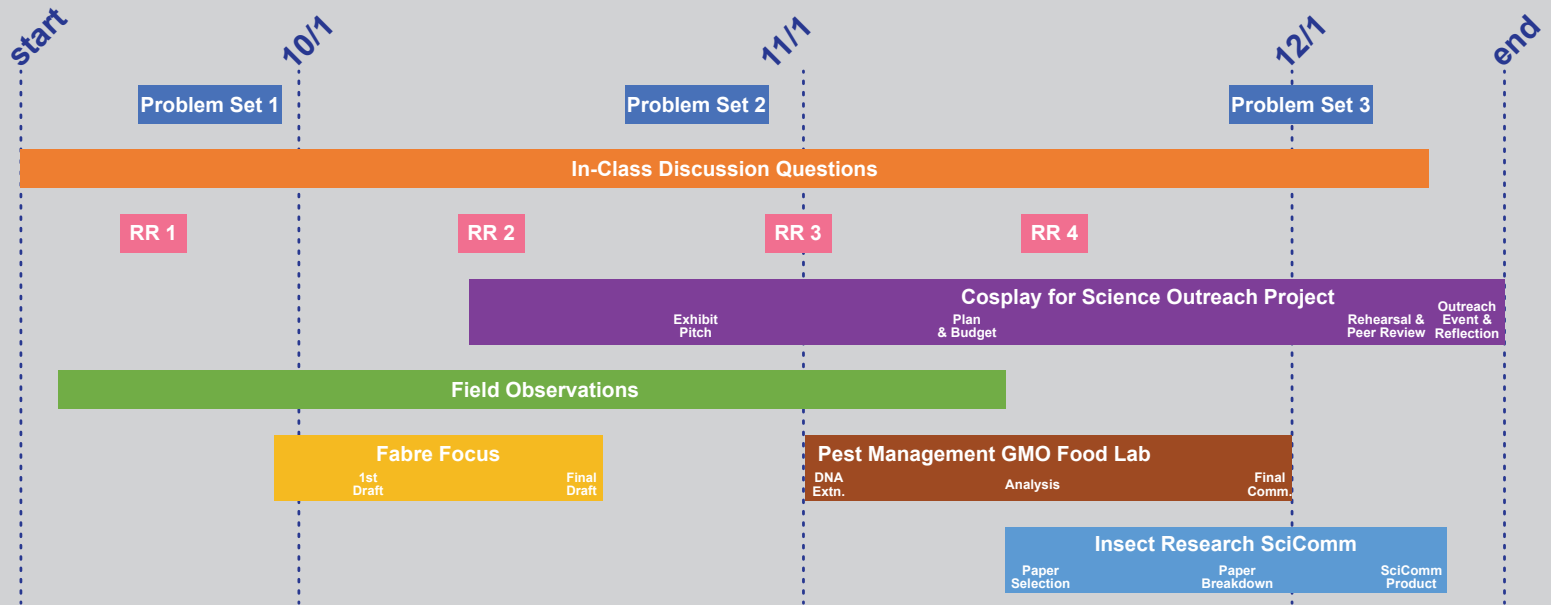


YOU'VE RECEIVED 3 FLEXIBILITY TOKENS!



- You can spend one of these to:
- receive a 48-hour extension on an assignment
 - resubmit an assignment that did not earn credit

ASSIGNMENT TIMELINE



Please see the most recent Course Schedule on our Slack Workspace for exact due dates. All work must be submitted before or on the due date.

COURSE ASSIGNMENTS AND POINTS BREAKDOWN

				TOTAL POINTS	FINAL GRADE
Cosplay for Science Outreach Project 80pts Exhibit Pitch 10pts Plan & Budget 20pts Rehearsal & Peer Review 10pts Outreach Event & Reflection 40pts	Field Observations 60pts 30 insects, no more than 6 per order	Reading Reflections 40pts 4 @ 10pts each	Pest Management GMO Food Lab 40pts	372-400	A
				360-371	A-
				348-359	B+
				332-347	B
				320-331	B-
				308-319	C+
				292-307	C
In-Class Discussion Questions 75pts	Take-Home Problem Sets 45pts 3 @ 15pts each	Fabre Focus 30pts	Insect Research SciComm 30pts	280-291	C-
				240-279	D
				≤239	F

DISABILITY ACCESS/ACCOMMODATION:

Students who have Letters of Accommodation in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. For those without Letters of Accommodation, assistance is available to eligible students through the Disability Resource Center (DRC). Please contact ADA Coordinators Jodi Litchfield, Peter Ploegman, and Deirdre Kelly of the DRC at ada@middlebury.edu for more information. All discussions will remain confidential.

Course Schedule

Date		Topic	Reading	Assignment Due
9/12	T	Course Intro and the Diverse World of Insects!		Listen to "Making the Grade" episode of The Happiness Lab podcast
9/14	R	External Anatomy I cuticle and head	<i>Extraordinary Insects</i> Ch. 1	
9/19	T	External Anatomy II thorax and abdomen		
9/21	R	Phylogeny and Classification Systematics, Non-Insect Relatives, and Insect Orders		Reading Reflection #1 due
9/26	T	Developmental Strategies and Molting Control		
9/28	R	Paper Discussion 2 papers from Sláma and Williams 1. Juvenile hormone activity for the bug <i>Pyrrhocoris apterus</i> . 1965 <i>PNAS</i> 2. 'Paper Factor' as an Inhibitor of the Embryonic Development of the European Bug, <i>Pyrrhocoris apterus</i> . 1966 <i>Nature</i>	Read papers before class discussion	Take Home Problem Set #1 due
10/3	T	Reproduction Mating and Morphology	<i>Extraordinary Insects</i> Ch. 2	
10/5	R	Paper discussion Brent et al. An insect anti-antiaphrodisiac. 2017 <i>eLife</i>	Read paper before class discussion	Fabre Focus 1 st Draft due by lab
10/10	T	Insect Predator-Prey Interactions	<i>Extraordinary Insects</i> Ch. 3	
10/12	R	Paper discussion 2 papers 1. Lee and Moss. Can the elongated hindwing tails of fluttering moths serve as false sonar targets to divert bat attacks? 2016 <i>J Acoust Soc Am</i> 2. Neil et al. Wingtip folds and ripples on saturniid moths create decoy echoes against bat biosonar. 2021 <i>Current Biology</i>	Read papers before class discussion	Reading Reflection #2 due
10/17	T	Sensory Systems and Behavior		
10/19	R	Charles H. Turner Tribute and Paper Discussion 1. Memoirs of Black Entomologists: Reflections on Childhood, University, and Career Experiences p 6-11 2. Turner. An Experimental Study of the Auditory Powers of the Giant Silkworm Moths (Saturniidae) 1914 <i>Biological Bulletin</i>	Read tribute and paper before class discussion	Fabre Focus Final Draft due
10/24	T	Paper Discussion Alem et al. Associative Mechanisms Allow for Social Learning and Cultural Transmission of String Pulling in an Insect. 2016. <i>PLOS Biology</i>	Read paper before class discussion	Cosplay for Science Exhibit Pitch due in lab
10/26	R	Insect Chemical Ecology		Take Home Problem Set #2 due
10/31	T	Plant-Insect Interactions	<i>Extraordinary Insects</i> Ch. 4	

11/2	R	Paper discussion Schiestl. Floral evolution and pollinator mate choice in a sexually deceptive orchid. 2003 <i>J Evol Biol</i>	Read paper before class discussion	Reading Reflection #3 due
11/7	T	Insects and Food	<i>Extraordinary Insects</i> Ch. 5	Cosplay for Science Plan & Budget due
11/9	R	Insect Pest Management		Field Observations due
11/14	T	Insects as Nature's Caretakers	<i>Extraordinary Insects</i> Ch. 6	Insect Research SciComm Paper Selection due
11/16	R	Paper Discussion 2 papers 1. Smolka et al. Dung beetles use their dung ball as a mobile thermal refuge. 2012. <i>Current Biology</i> 2. Dacke et al. Dung Beetles Use the Milky Way for Orientation. 2013. <i>Current Biology</i>	Read papers before class discussion	Reading Reflection #4 due
11/20-11/24		<i>Thanksgiving Recess – no class</i>		
11/28	T	Share and Work on Cosplay for Science Project		Insect Research SciComm Paper Breakdown due
11/30	R	Medical and Veterinary Entomology Mosquito- and other Vector-Borne Diseases		Pest Management GMO Lab Final Communication due
12/5	T	Industrious Insects and Entomophagy	<i>Extraordinary Insects</i> Ch. 7	Take Home Problem Set #3 due
12/7	R	SciComm Projects and Course Wrap-Up		Insect Research SciComm Product due
12/8	F	Cosplay for Science Dress Rehearsal and Peer Review in the evening (with food!) 6-8PM		
12/9	S	Cosplay for Science Outreach Event 1-4PM		Cosplay for Science Reflection due 12/13

Lab Schedule

Week	Date	Field/Lab Activities
1	9/13-9/14	Field Collection and iNaturalist Expectations, Evening Blacklighting
2	9/20-9/21	Field Trip to Champlain Valley Apiaries
3	9/27-9/28	Fabre Readings and Assignment Description, Knoll/TAM exploration
4	10/4-10/5	Field Trip TBD
5	10/11-10/12	Cosplay For Science - Introduction with G. Santos
6	10/18-10/19	Cosplay For Science - Brainstorming
7	10/25-10/26	Cosplay For Science - Exhibit Pitch Day
8	11/1-11/2	Pest Management GMO Food Lab
9	11/8-11/9	Pest Management GMO Food Lab
10	11/15-11/16	Pest Management GMO Food Lab
11	11/29-11/30	Cosplay For Science - Exhibit Work Day
12	12/6-12/7	Cosplay For Science - Exhibit Work Day