

BIOL 204 ENTOMOLOGY

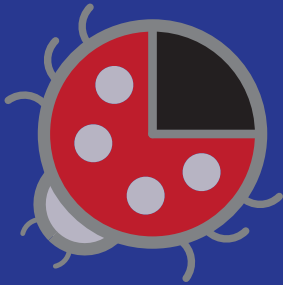
Fall 2024

Lecture: MW 9:45-11AM in MBH 311

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.

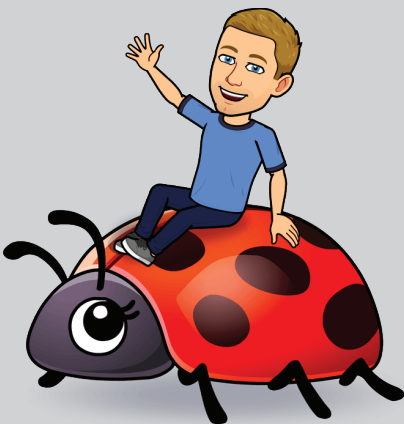
Course Focus

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 9-11AM, or by appointment

Office: MBH 315

Email: gpask@middlebury.edu

COURSE MATERIALS

Slack Workspace: biol204f24.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.

Collaborate with members of a group toward a shared project goal of a scientific outreach community event.

HOW YOU'LL PROGRESS TOWARD THESE GOALS:



Reading and Reflections



In-Class Discussion Questions



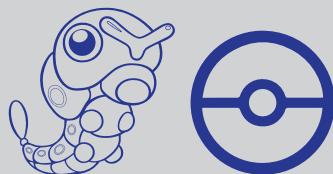
Take-Home Problem Sets



Field Observations and Fabre Focus



Independent Research Project



Cosplay for Science Outreach Project

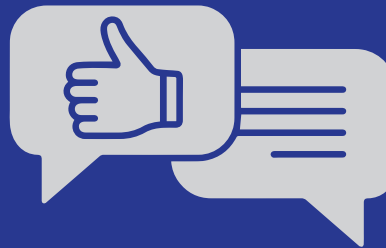


Invitation to Awe Reflection

HOW I WILL ASSESS YOUR PROGRESS

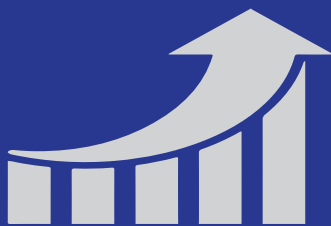
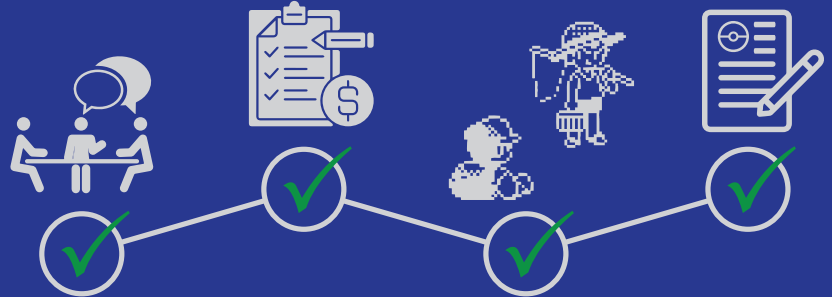
This course will use a labor-based grading approach that centers on feedback, improvement, integrative thinking, idea development, and effective communication. I strongly believe that traditional assessment practices focus too much on “the grade” and can increase stress and/or decrease risk-taking. Instead, 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



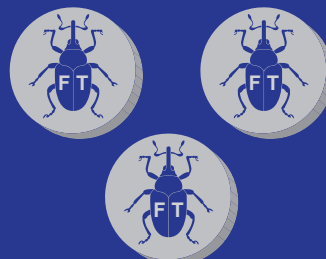
BE CURIOUS



WORK HARD

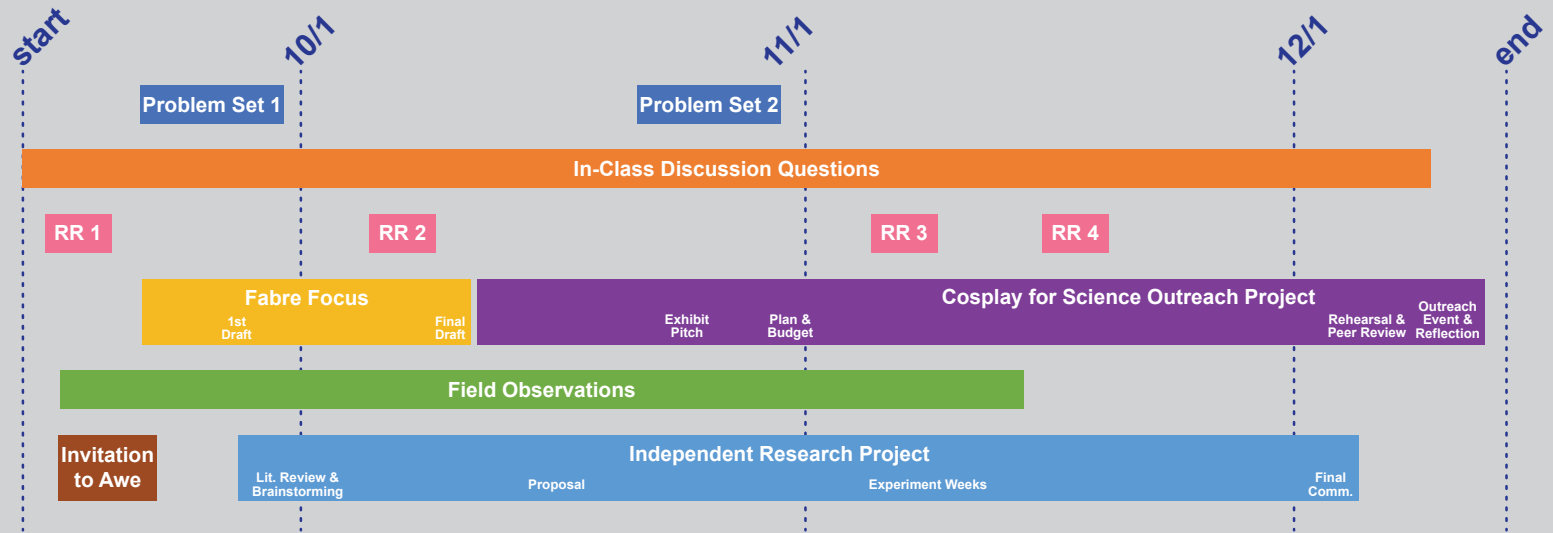


YOU'VE RECEIVED 3 FLEXIBILITY TOKENS!



- 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

<p>Cosplay for Science Outreach Project 80pts Exhibit Pitch 10pts Plan & Budget 20pts Rehearsal & Peer Review 10pts Outreach Event & Reflection 40pts</p>	<p>Field Observations 60pts 30 insects, no more than 6 per order</p>	<p>Reading Reflections 40pts 4 @ 10pts each</p>	<p>Fabre Focus 30pts</p>
<p>In-Class Discussion Questions 75pts</p>	<p>Independent Research Project 60pts</p>	<p>Take-Home Problem Sets 30 pts 2 @ 15pts each</p>	<p>Invitation to Awe Reflection 20 pts</p>

TOTAL POINTS	FINAL GRADE
372-400	A
360-371	A-
348-359	B+
332-347	B
320-331	B-
308-319	C+
292-307	C
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
9/9	M	Course Intro and the Diverse World of Insects!		Listen to "Making the Grade" episode of The Happiness Lab podcast
9/11	W	External Anatomy I cuticle and head	<i>Extraordinary Insects</i> Ch. 1	
9/16	M	External Anatomy II thorax and abdomen		Reading Reflection #1 due
9/18	W	Phylogeny and Classification Systematics, Non-Insect Relatives, and Insect Orders		Invitation to Awe Reflection due
9/23	M	Internal Physiology and Development		
9/25	W	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	Fabre Focus 1 st Draft due by lab Independent Research Project Literature Review & Brainstorming in lab
9/30	M	Reproduction Mating and Morphology	<i>Extraordinary Insects</i> Ch. 2	Take Home Problem Set #1 due
10/2	W	Paper discussion 2 papers 1. Rodríguez-Muñoz et al. Guarding Males Protect Females from Predation in a Wild Insect. 2011 <i>Current Biology</i> 2. Hosseini et al. Experimental evidence for chemical mate guarding in a moth. 2016 <i>Scientific Reports</i>	Read papers before class discussion	
10/7	M	Insect Predator-Prey Interactions	<i>Extraordinary Insects</i> Ch. 3	Reading Reflection #2 due
10/9	W	Paper discussion 2 papers 1. Barber et al. Moth tails divert bat attack: Evolution of acoustic deflection. 2015 <i>PNAS</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	Fabre Focus Final Draft due
10/14	M	Sensory Systems and Behavior		
10/16	W	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	Independent Research Project Proposal due
10/21	M	Insect Chemical Ecology		
10/23	W	Charles H. Turner Tribute and Paper Discussion <i>with Beyond the Page!</i> 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 <i>and</i> paper before class discussion	Cosplay for Science Exhibit Pitch due in lab

10/28	M	Plant-Insect Interactions	<i>Extraordinary Insects</i> Ch. 4	Take Home Problem Set #2 due
10/30	W	Paper discussion 2 papers 1. Schiestl et al. Orchid pollination by sexual swindle. 1999 <i>Science</i> 2. Schiestl. Floral evolution and pollinator mate choice in a sexually deceptive orchid. 2003 <i>J Evol Biol</i>	Read papers before class discussion	Cosplay for Science Plan & Budget due
11/4	M	Insects and Food	<i>Extraordinary Insects</i> Ch. 5	
11/6	W	Insect Pest Management		Reading Reflection #3 due
11/11	M	Insects as Nature's Caretakers	<i>Extraordinary Insects</i> Ch. 6	
11/13	W	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	Field Observations due
11/18	M	Share and Work on Cosplay for Science Project		Reading Reflection #4 due
11/20	W	Medical and Veterinary Entomology Mosquito- and other Vector-Borne Diseases		
11/25-11/29		<i>Thanksgiving Recess – no class</i>		
12/2	M	Industrious Insects and Entomophagy	<i>Extraordinary Insects</i> Ch. 7	
12/4	W	Course Wrap-Up		Independent Research Project Final Communication due
12/6	F	Cosplay for Science Dress Rehearsal and Peer Review in the evening (<i>with food!</i>) 6-8PM		
12/7	S	Cosplay for Science Outreach Event 1-4PM		Cosplay for Science Reflection due 12/11

Lab Schedule

Week	Date	Field/Lab Activities
1	9/11-9/12	Field Collection and iNaturalist Expectations, Evening Blacklighting
2	9/18-9/19	Fabre Readings and Assignment Description, Knoll/TAM exploration
3	9/25-9/26	Independent Research Projects - Planning
4	10/2-10/3	Field Trip to Champlain Valley Apiaries
5	10/9-10/10	Cosplay For Science - Introduction with G. Santos
6	10/16-10/17	Cosplay For Science - Brainstorming
7	10/23-10/24	Cosplay For Science - Exhibit Pitch Day
8	10/30-10/31	Independent Research Projects
9	11/6-11/7	Independent Research Projects
10	11/13-11/14	Independent Research Projects
11	11/20-11/21	Cosplay For Science - Exhibit Work Day
12	12/4-12/5	Cosplay For Science - Exhibit Work Day