

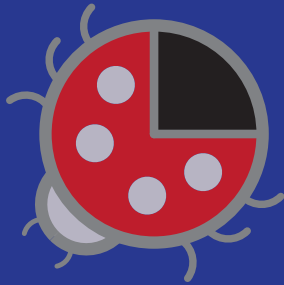
# BIOL 204 ENTOMOLOGY

Lecture: TR 9:30-10:45AM in MBH 411

Lab: TW 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 the development and execution of a novel research project.

## 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:** MR 1:00-3:00PM, or by appointment

**Office:** MBH 315

**Email:** gpask@middlebury.edu

**Twitter:** @G\_Pask

## COURSE MATERIALS

**Slack Workspace:** [biol204f22.slack.com](https://biol204f22.slack.com) for all course-related business

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

## 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 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 and communicate their own understanding of insect biology to both expert and non-expert audiences.**

## HOW YOU'LL PROGRESS TOWARD THESE GOALS:



**Reading and  
Reflections**



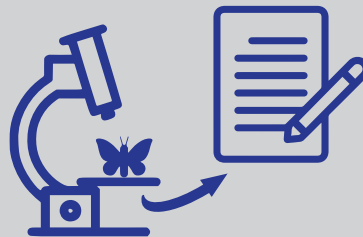
**In-Class Discussion  
Questions**



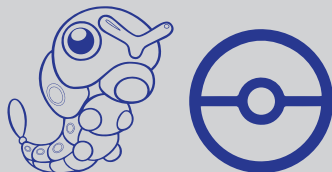
**Take-Home  
Problem Sets**



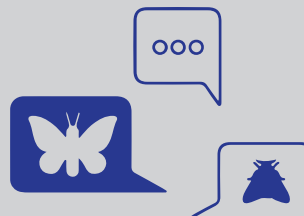
**Field Observations  
and Fabre Focus**



**Butterfly Research  
Project**



**Cosplay for Science  
Outreach Project**



**Insect Twitter  
Threads**

## HOW I WILL ASSESS YOUR PROGRESS

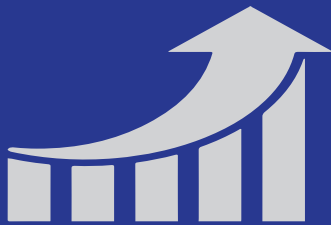
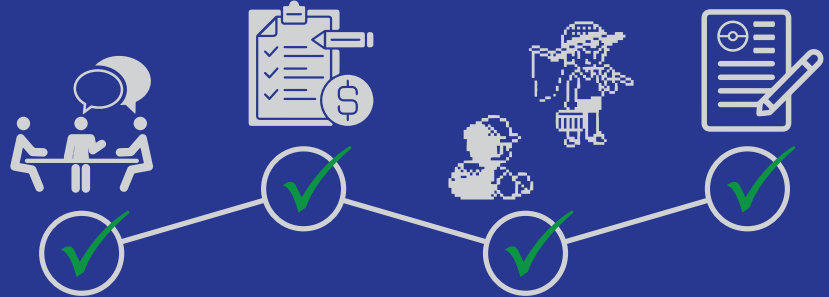
This course will use a labor-based grading approach that centers on feedback, improvement, integrative thinking, idea development, and effective communication. I strongly believe that traditional assessment practices focus too much on “the grade” and can increase stress and/or decrease risk-taking. Instead,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

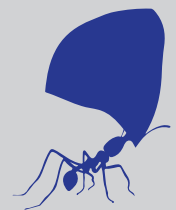
### BE ENGAGED



### BE CURIOUS



### WORK HARD

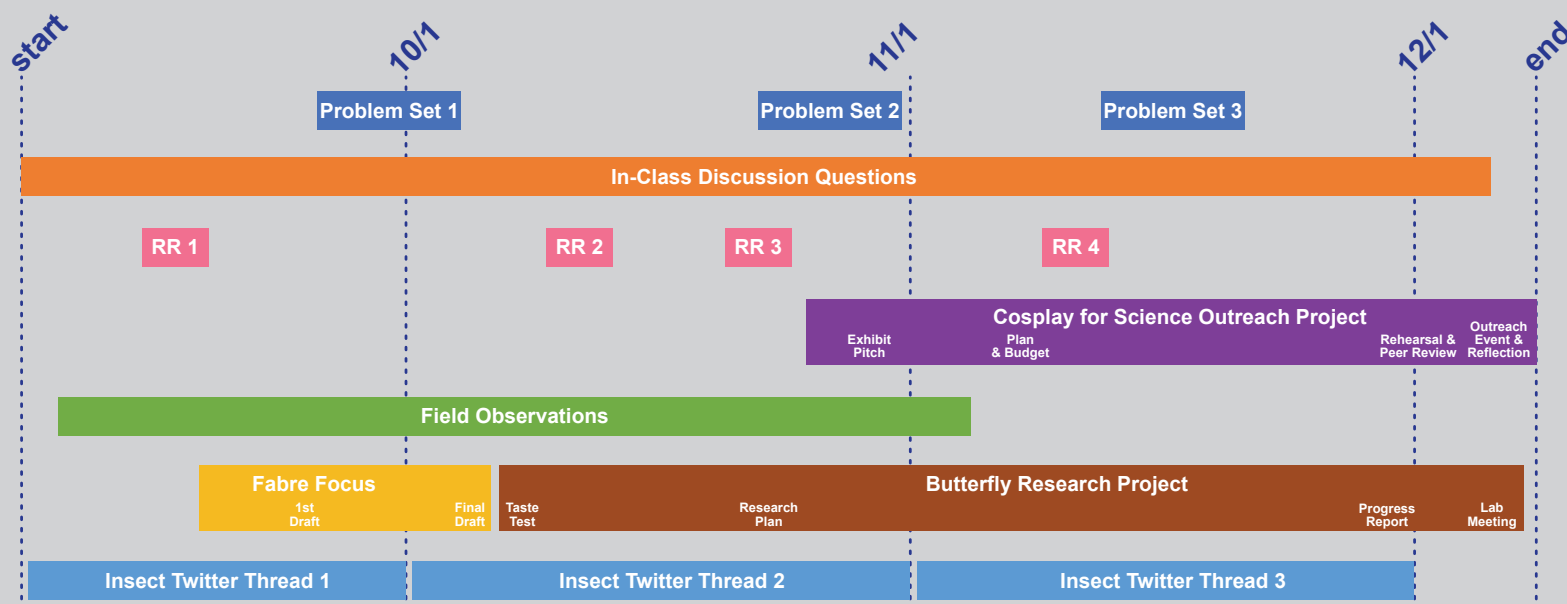


## ACADEMIC INTEGRITY



I believe that Academic Honesty and Integrity is of the utmost importance, so the language from the Honor Code in the Middlebury Handbook (section B.1.a.) resonates with my values. Please include the Honor Code Pledge (“I have neither given nor received unauthorized aid on this assignment.”) on all assignments for this course. If you are unsure of whether a specific action in this course would violate the Academic Honesty Policy in this course, I urge you to check with me beforehand. Any suspected instances of the Academic Honesty Policy will be brought to the attention of the judicial affairs officer.

## 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

<b>Cosplay for Science Outreach Project</b> 80pts Exhibit Pitch 10pts Plan & Budget 20 pts Rehearsal & Peer Review 10pts Outreach Event & Reflection 40pts	<b>In-Class Discussion Questions</b> 72pts 6pts/week	<b>Take-Home Problem Sets</b> 60pts 3 @ 20pts each	<b>Butterfly Research Project</b> 40pts Research Plan 10pts Progress Report 10pts Lab Meeting 20pts	<b>369-397</b>	<b>A</b>
	<b>Field Observations</b> 60pts 30 insects, no more than 6 per order		<b>Reading Reflections</b> 40pts 4 @ 10 pts each	<b>Fabre Focus</b> 30pts	<b>357-368</b>
		<b>345-356</b>			<b>B+</b>
		<b>329-344</b>			<b>B</b>
		<b>317-328</b>			<b>B-</b>
		<b>305-316</b>		<b>C+</b>	
		<b>289-304</b>		<b>C</b>	
	<b>277-288</b>	<b>C-</b>			
<b>Insect Twitter Threads</b> 15pts 3 @ 5 pts each	<b>238-276</b>	<b>D</b>			
	<b>≤237</b>	<b>F</b>			

## 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 (formerly called Student Accessibility Services). Please contact the ADA Coordinators Jodi Litchfield (litchfie@middlebury.edu, 802-443-5936) or Peter Ploegman (pploegman@middlebury.edu, 802-443-2382) for more information. All discussions will remain confidential.

## Course Schedule

Date		Topic	Reading	Assignment Due
9/13	T	Course Intro and the Diverse World of Insects!		(*listening*) Making the Grade – The Happiness Lab
9/15	R	External Anatomy I cuticle and head	<i>Extraordinary Insects</i> Ch. 1-2	
9/20	T	External Anatomy II thorax and abdomen		
9/22	R	Phylogeny and Classification Systematics, Non-Insect Relatives, and Insect Orders	<i>Extraordinary Insects</i> Ch. 3-4	Reading Reflection #1 due
9/27	T	Evolution and Diversification of Insects	<i>Extraordinary Insects</i> Ch. 5-6	Fabre Focus 1 <sup>st</sup> Draft due by lab
9/29	R	Internal Anatomy and Physiology I Muscular, Nervous, Endocrine, and Circulatory Systems		
10/4	T	Internal Anatomy and Physiology II Tracheal, Digestive, Excretory, and Reproductive Systems	<i>Extraordinary Insects</i> Ch. 7-8	Take Home Problem Set #1 due
10/6	R	Paper Discussion Karageorgi et al. Genome editing retraces the evolution of toxin resistance in the monarch butterfly. 2019 <i>Nature</i>	Read paper before class discussion	Fabre Focus Final Draft due
10/11	T	Reproduction Mating and Morphology	<i>Extraordinary Insects</i> Ch. 9	
10/13	R	Developmental Strategies and Molting Control		Reading Reflection #2 due
10/18	T	Paper Discussion 2 papers from Sláma and Williams Juvenile hormone activity for the bug <i>Pyrrhocoris apterus</i> . 1965 <i>PNAS</i> '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	Butterfly Project Research Plan due
10/20	R	Sensory Systems I Mechano-, Thermo-, and Chemosensation		Reading Reflection #3 due
10/25	T	Sensory Systems II Vision and Behavior		Cosplay for Science Exhibit Pitch due in lab
10/27	R	Charles H. Turner Tribute and Paper Discussion Memoirs of Black Entomologists: Reflections on Childhood, University, and Career Experiences p 6-11  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	Take Home Problem Set #2 due
11/1	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	
11/3	R	Cosplay for Science – work on Exhibit Plan and Budget		Field Observations due
11/8	T	Plant-Insect Interactions		Cosplay for Science Plan & Budget due

<b>11/10</b>	R	Paper Discussion Salerno et al. Mating Status of an Herbivorous Stink Bug Female Affects the Emission of Oviposition-Induced Plant Volatiles Exploited by an Egg Parasitoid. 2019. <i>Frontiers in Physiology</i>	Read paper before class discussion	Reading Reflection #4 due
<b>11/15</b>	T	No formal class – work on Cosplay for Science Project		
<b>11/17</b>	R	Paper Discussion Smolka et al. Dung beetles use their dung ball as a mobile thermal refuge. 2012. <i>Current Biology</i>  Dacke et al. Dung Beetles Use the Milky Way for Orientation. 2013. <i>Current Biology</i>	Read papers before class discussion	Take Home Problem Set #3 due
<b>11/21-11/25</b>		Thanksgiving Recess – no class		
<b>11/29</b>	T	Medical and Veterinary Entomology Mosquito- and other Vector-Borne Diseases		Butterfly Project Progress Report due
<b>12/1</b>	R	Insect Pest Management		
<b>12/5</b>	M	Cosplay for Science Dress Rehearsal and Peer Review in the evening ( <i>with food!</i> )		
<b>12/6</b>	T	Paper Discussion Howell et al. Control of Codling Moth in Apple and Pear with Sex Pheromone-Mediated Mating Disruption. 1992. <i>J Economic Entomology</i>	Read paper before class discussion	
<b>12/8</b>	R	Butterfly Project Lab Meeting Presentations and Course Wrap-up		
<b>12/10</b>	S	Cosplay for Science Outreach Event		Cosplay for Science Reflection due 12/13

## Lab Schedule

Date	Field/Lab Activities
9/13-9/14	Field Collection and iNaturalist Expectations, Evening Blacklighting
9/20-9/21	Fabre Readings and Assignment Description, Knoll/TAM exploration
9/27-9/28	Field Trip to TBD
10/4-10/5	Butterfly Taste Experiment
10/11-10/12	Butterfly Project Planning
10/18-10/19	Butterfly Project Starts
10/25-10/26	Cosplay For Science Chat with G. Santos and Planning with BIOL 308
11/1-11/2	Cosplay for Science Prep with BIOL 308
11/8-11/9	Butterfly Project
11/15-11/16	Cosplay for Science Prep with BIOL 308
11/29-11/30	Butterfly Project
12/6-12/7	Butterfly Project and Clean Up