Instructors:
Dr. Phil Starks, Course Coordinator
Robinson 356, 617-627-4849
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Office hours: Mon 1:30-3:30

Dr. Jan Pechenik
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Office hours: by appointment (email with 3 times that work for you)

Dr. George Ellmore
Robinson 358, 617-627-3188
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Office hours: Thurs 10:00-12:00

Teaching Assistants:
Genevieve Pugesek (Thursday Lab)
SEC
genevieve.pugesek@tufts.edu
Office hours: Tues 5:30-7:30

Isaac Weinberg (Wednesday Lab)
Anderson 351
isaac.weinberg@tufts.edu
Office hours: Wed 11:00-1:00

Meeting Times: Tuesdays 4:30-5:20 pm in Anderson Wing 312 for joint discussion session, and either Wednesdays (Sec. A) or Thursdays (Sec. B) 1:30-5:00 pm in SEC Research Lab Wing 027E for lab sessions. The Wednesday and Thursday afternoon classes are likely to run longer on weeks that involve field trips (see schedule below). Make sure to plan your fall schedules accordingly. Please contact Dr. Starks if you have any questions. ATTENDANCE (FOR LAB SESSIONS AND FOR DISCUSSION SESSIONS) IS MANDATORY. YOU WILL NOT BE ALLOWED TO SWITCH LAB SECTIONS AFTER THE START OF THE SEMESTER. Dress appropriately for field conditions on days that you will be doing fieldwork.

Course Goals: To teach you a variety of techniques from contemporary ecology, and to provide a substantial research context for their use. Each of you will leave the course with experience in: 1) taxonomic identification of organisms, 2) framing research questions, 3) designing experiments, 4) censusing populations, 5) analyzing data, and 6) presenting data both orally and in writing. For each unit, you will be oriented to some general aspects of a particular problem. Then you will work in small groups to investigate specific research questions, some of which may be your own. Finally, your group members will present their results to the class, and you will submit individual, written research reports.

Text: A Short Guide to Writing about Biology, 9th edition by Jan A. Pechenik; additional papers to be assigned.

Course Requirements and Grading:
- 3 Partial Research Papers .......................... 30% (10% each)
- 3 Group Oral Presentations .......................... 30% (10% each)
- 1 Final Complete Research Report .................. 20%
- 3 Reading Responses .......................... 15% (5% each)
- Participation ........................................ 5%

All research reports (including drafts) must be dropped off – in hard copy form – at the main office (Robinson 369). The Final Complete Research Report that you submit at the end of the term will be based on only one of the three units. This report will be more comprehensive than the other reports that you turn in, and it will require library research. When you turn this report in, you must also include the previous two drafts (partial report with TA comments and partial report with instructor comments). NOTE: partial and final papers submitted late will lose 5% of your grade per day, drafts handed in late to TAs will not be reviewed. Each unexcused lab or discussion session missed will result in losing 1/3 of a grade, three absences will result in an F for the course.

Each instructor will assign readings for their unit; assignments and discussions will focus on those readings.
**Unit 1: Honey Bees (Starks)**

1. **T** Sept 3  Course Introduction (Starks et al.) **Assign reading I for Sept 10.**  
   **W** Sept 4  Introduction to the scientific method, levels of analysis, and honey bee sociobiology, followed by walk to field site (Starks)  
   **Th** Sept 5  Introduction to the scientific method, levels of analysis, and honey bee sociobiology, followed by walk to field site (Starks)

2. **T** Sept 10  Introduction to reading and writing research papers, to heat-shielding, and to data collection. **Read chapter 9 in Pechenik prior to class Reading Response I due.**  
   **W** Sept 11  Honey bee heat-shielding I: Class Project  
   **Th** Sept 12  Honey bee heat-shielding I: Class Project

3. **T** Sept 17  Review of class field data; graphical data representation & statistical analysis. **Read chapter 4 in Pechenik prior to class**  
   **W** Sept 18  Honey bee heat-shielding II: Group Projects  
   **Th** Sept 19  Honey bee heat-shielding II: Group Projects

4. **T** Sept 24  Introduction to hermit crab behavior  
   **W** Sept 25  Field Trip: Assessing hermit crab shell quality  
   **Th** Sept 26  Field Trip: Assessing hermit crab shell quality

5. **T** Oct 1  Revisit graphing and analysis, introduction to scientific presentations, and a workshop on Unit 1 oral presentations.  
   **W** Oct 2  Mini-Symposium – Honey Bees  
   **Th** Oct 3  Mini-Symposium – Honey Bees

- **Due by noon Monday October 7 in TA’s mailbox:** Draft of Partial Research Paper on Unit 1—Title, Methods, Results, Acknowledgements, & Literature Cited  
- **Oct 9, 10:** Marked Draft Research Papers will be returned to students at the end of class.  
- **Due by noon Monday October 14 in Prof Starks’ mailbox:** Final Version of Unit 1 Partial Research Paper

**Unit 2: Forest Phenolics (Ellmore)**

6. **T** Oct 8  Canopy layers in old growth forests. **Assign reading II for Oct 22.**  
   **W** Oct 9  Field Trip: Layered Forest landscape ecology  
   **Th** Oct 10  Field Trip: Layered Forest landscape ecology

7. **T** Oct 15  **Tufts Monday, No Class**  
   **W** Oct 16  Campus Field Trip: trees, keys and leaves  
   **Th** Oct 17  Campus Field Trip: trees, keys and leaves

8. **T** Oct 22  The chemistry of tea. **Reading Response II due.**  
   **W** Oct 23  Total phenolics from single and from sequential infusions of Tea  
   **Th** Oct 24  Total phenolics from single and from sequential infusions of Tea
9 T Oct 29 Discussion, Plan Group Projects
W Oct 30 Team testing of Tea processing, seasonality, varietals
Th Oct 31 Team testing of Tea processing, seasonality, varietals

10 T Nov 5 Discussion, Visualizing Data, Presentation Workshop Assign reading III for Nov 12.
W Nov 6 Mini-Symposium – Drivers of phenolic profiles in Tea trees
Th Nov 7 Mini-Symposium – Drivers of phenolic profiles in Tea trees

- Due by noon Monday November 11 in TA’s mailbox: Draft of Partial Research Paper on Unit 2—Title, Introduction, Results, Acknowledgments, & Literature Cited
- Nov 13, 14: Marked Ellmore Draft Research Papers will be returned to students at the end of class.
- Due by noon Monday November 18 in Prof. Ellmore’s mailbox: Final Version of Unit 2 Partial Research Paper (NOTE: This is the Monday BEFORE Thanksgiving – Plan accordingly)

Unit 3: Hermit Crab Shell Selection Behavior (Pechenik)

11 T Nov 12 Hermit Crab Shell Selection Reading Response III due
W Nov 13 Class Project:
Th Nov 14 Class Project:

[T, W, Th Nov 19-21 No Class - Thanksgiving Break]

12 T Nov 26 Re-entry calibration, directed discussion
W Nov 27 Group Projects
Th Nov 28 Group Projects

13 T Dec 3 Workshop on final presentations
W Dec 4 Mini-Symposium — Hermit Crabs
Th Dec 5 Mini-Symposium — Hermit Crabs

- Due by noon Monday Dec 9 in TA’s mailbox: Draft of Partial Research Paper on Unit 3—Title, Results, Discussion, Acknowledgments, & Literature Cited
- Dec 10: Marked Draft Research Papers can be picked up after noon in the main office.
- Due by noon Friday Dec 13 in Prof. Pechenik’s mailbox: Final Version of Unit 3 Partial Research Paper
- Dec 16: Unit 3 Partial Research Papers for those students writing the full report on hermit crabs will be graded and available in Robinson 369
- Dec 16: Full research paper – title, introduction, methods, results (including tables and / or figures), discussion, acknowledgements, references – assignments will be determined.
- Due by noon Thursday Dec 19: Final Complete Research Paper (give to Monica Morin, Dept. Secretary, Robinson 369)