

Animal Behaviour Laboratory- PNB 3S03. Dr. Reuven Dukas. Winter 2018

Location: PC 116, 316, 154. Please check schedule below for the relevant location.

Time: Monday 14:30-17:20; January 8 - April 9, 2018

Instructor: Dr. Reuven Dukas (dukas@mcmaster.ca, PC 104). **Office hour:** By appointment.

Teaching Assistants: David Filice (filicd1@mcmaster.ca), Carling Baxter (baxtercm@mcmaster.ca) PC 151, phone: 26042). **Office Hours:** by appointment.

Textbook: Pechenik, J. A. 2013. *A Short Guide to Writing About Biology*, 8th ed. Longman, New York. (**Earlier editions are fine. Many cheap, used copies are available**).

Objectives. By the end of this course the students will be able to:

1. Formulate a testable prediction.
2. Design a proper experimental protocol to falsify that prediction.
3. Verify that the protocol has the power to falsify the prediction. Critically assess all possible alternatives and include additional treatments, controls, or further experiments if necessary. Design a blind protocol.
4. Consider issues of sample size, statistical analyses and statistical power.
5. Consider issues of safety and animal ethics.
6. Plan all the necessary hardware and logistics for the experiment.
7. **Write a research proposal including all the above components.**
8. Conduct the experiment and record the data.
9. Analyze the data and draw conclusions.
10. Discuss the results, suggest weaknesses, alternatives and further experiments.
11. **Write a research paper that includes all of the above elements.**
12. **Give a PowerPoint presentation of the research paper.**

Assumptions about the students' prior knowledge: animal behaviour, evolution, 2 semesters of statistics, and computer software including Excel. Students should refresh their knowledge if necessary.

Outline: The course will consist of two class experiments followed by independent projects carried out and presented by small teams of students. See the schedule.

Project: Must be a planned experiment with a sufficient number of individuals of an invertebrate species and conducted according to the scientific method and academic ethics. Ideas for experiments may be found in animal behavior textbooks, journals, papers and the following books in Thode library: Ploger BJ, Yasukawa K, 2002. *Exploring Animal Behavior in Laboratory and Field* (Academic Press.). Zhang, B., Freeman, M. R. & Waddell, S. 2010. *Drosophila neurobiology: a laboratory manual*. Cold Spring Harbor, N.Y.: Cold Spring Harbor Laboratory Press.

Assignments and grades: Each student must upload to Avenue his / her **independently written assignment by noon** on the dates indicated below. **The paper must follow the instructions on the checklist and relevant guidance from Pechenik's book. The work you submit (text and Figures) must be written, revised and edited only by yourself.** All grades will be given in percentages. The final mark will be calculated as noted in the schedule, with 10% given for quality of participation in class discussions and performance in the experiments and independent project. Late papers will be subjected to a penalty of 10% per day. **Lab attendance is mandatory. Unexcused misses will be subjected to a penalty of 10% per day.**

Academic dishonesty: Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to McMaster's Academic Integrity Policy, specifically Appendix 3, located under the Senate Policy Statements in the online calendar. **We will take measures to**

verify the uniqueness of your work. This may include consultation with other instructors at McMaster and the use of electronic search engines and data bases.

Schedule (Pechenik's chapters are based on the 8th edition, 2013)

Date	Activity	Class Meeting	Assignments & grades
Jan 8	Introduction: preparing, conducting & presenting animal behaviour research. Choosing a project	316	Ch. 1-3.
Jan 15	Experiment 1: Sperm competition in fruit flies (TA: David)	116	Ch. 10. Proposal 1 (2.5%) Please bring calculators & stopwatches
Jan 22	Analysing experimental data	*** 154***	Ch. 9. Paper 1 (7.5%)
Jan 29	Experiment 2: Effects of starvation on aggression (TA: Carling)	116	Ch. 6. Proposal 2 (5%) Please bring calculators & stopwatches
Feb 5	Presentation tutorial & project discussion	316	Ch. 4-5. Paper 2 (10%)
Feb 12	Proposal presentation (team)	316	Ch. 11. Proposal outline (written independently by each student ; 3%)
Feb 26	Research project	No	Final proposal (written independently by each student ; 12%)
March 5	Research project	No	
March 12	Research project	No	
March 19	Research project	No	
March 26	Research project	No	
April 2	Project presentations (team)	316	Project presentation (10%)
April 9	Submit project papers	No	Project paper (written independently by each student ; 40%)