

Location: Psychology 316, 116

Time: Tuesday 11:30-14:20; January 8 - April 8, 2008

Instructor: Dr. Reuven Dukas (office - PC 104, e-mail: dukas@mcmaster.ca).

Teaching Assistants: Sachin Sarin (sarins@mcmaster.ca) Viktoria Mileva (milevavr@mcmaster.ca) (Office - PC 235, phone - 26042).

Office Hours: Please e-mail us to schedule an appointment.

Web page: <http://psych.mcmaster.ca/dukas/abl.htm>

Textbook: Pechenik, J. A. 2007. *A Short Guide to Writing About Biology*, 6th ed. (or any other recent edition). Longman, New York. (Required text in a few Biology courses).

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 hypothesis. 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 analysis and power.
5. Consider issues of safety and animal care.
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-assisted presentation of the research paper.**

Assumptions about the students' prior knowledge: evolution, statistics, animal behaviour, 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 pairs of students. See the schedule.

Project: Must be a planned experiment with a sufficient number of individuals of a non-human species and conducted according to the scientific method, academic ethics, and animal-care regulations. Ideas for experiments may be found in animal behavior textbooks and journals, and the following book kept on reserve in Thode library: Ploger BJ, Yasukawa K, 2002. *Exploring Animal Behavior in Laboratory and Field* (Academic Press.)

Assignments and grades: Each student must e-mail all assignments to Dr. Dukas **by 10 AM** on the dates indicated below following the instructions on the checklist. 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, experiments and the 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 at http://www.mcmaster.ca/senate/academic/ac_integrity.htm. **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

| Date | Activity | Class Meeting | Assignments & grades |
|----------|--|---------------|--|
| Jan 8 | Introduction: preparing, conducting & presenting animal behaviour research | 316 | Ch. 1-3. |
| Jan 15 | Choosing a project. Analysing experimental data | 316 | Ch. 4-5. |
| Jan 22 | Experiment 1: mate choice in fruit flies | 116 | Ch. 10. Proposal 1 (2.5%) (please bring calculators) |
| Jan 29 | Project discussion & presentation tutorial | 316 | Ch. 6. Paper 1 (7.5%) |
| Feb 5 | Experiment 2: interspecific courtship in fruit flies | 116 | Ch. 9. Proposal 2 (5%) (please bring calculators) |
| Feb 12 | Proposal presentation (team) | 316 | Ch. 14. Paper 2 (10%) Proposal outline (one per team; 3%) |
| Feb 26 | Research project | 316 | Final proposal (12%) |
| March 4 | Research project | No | |
| March 11 | Research project | No | Each team must meet with Dr. Dukas by Mar. 16 |
| March 18 | Research project | No | |
| March 25 | | | |
| April 1 | Project presentations (team) | 316 | Project presentation (10%) |
| April 8 | E-mail project papers | No | Project paper (40%) |