

Biology 4602/3 - Fall 2009

## Field Research in Animal Ecology and Energetics

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**General information:** This upper-year course will cover topics at the interface of animal physiology, behaviour and ecology. Students will learn field and laboratory methods used to study ecological energetics and evolutionary physiology of free-ranging or wild-captured individuals, with a focus on small terrestrial mammals and bats. These methods include small mammal trapping and species identification, radiotelemetry for monitoring individual behaviour and habitat selection, and remote temperature telemetry for quantifying body temperature and use of torpor in free-living mammals. You will also learn open-circuit respirometry, one of the most important techniques used to study metabolism and energy balance in wild animals, laboratory animals and people. Although the focus will be on small mammal ecology, behaviour and energetics, you will also have the opportunities to study songbirds, non-endothemic vertebrates (e.g., amphibians and fish) and invertebrates (esp. insects), if you wish.

**Organisation of the course:** We will meet several times throughout the fall term of 2009 for discussion and student seminar presentations (see below). The field component of the course (the most important part!) will occur during a 10-day field camp in July 2009 at the University of Manitoba, Delta Marsh Field Station. During the first several days of the course you will receive hands-on instruction in a range of techniques. These will include methods for measurement of environmental and animal temperatures using remote dataloggers and radiotransmitters, studying behavioural and physiological thermoregulation in captive and free-living animals, studying foraging behaviour and foraging energetics, and quantifying metabolic rates. You will then develop a research question for your independent project and, with guidance from the instructor and demonstrator, spend the bulk of the course collecting data to address your question using one or more of these techniques.

Students are expected to stay at the field station for the 10-day period and must be prepared for fieldwork (i.e., you must bring rain gear, rubber boots, sunscreen, insect repellent, a positive attitude etc.). Wild animals have to keep working in all kinds of weather and we will too.

**Recommended Reference Texts** (copies will be available for students to browse during the field course and on reserve during fall term)

Hill, R.W., Wyse, G.A., Anderson, M. 2008. *Animal Physiology*. 2<sup>nd</sup> Edition. Sinauer Associates.

Lighton, J.R.B. 2008. *Measuring Metabolic Rates: A Manual for Scientists*. Oxford University Press.

McNab B.K. 2002. *The Physiological Ecology of Vertebrates: A View from Energetics*. Cornell University Press.

Randall D., Burggren, W, and French, K. 2002. *Eckert Animal Physiology: Mechanisms and Adaptations*. 5<sup>th</sup> Edition. W. H. Freeman and Company.

Alcock, J. 2005. *Animal Behavior: An evolutionary approach*. Sinaur

**Assessment of Performance:** There are no exams in this course. The overall grade will be based on participation and effort during the field course (including during groups discussions of relevant scientific papers), a short presentation of a research proposal partway through the field course, a seminar presented during the fall term (based on the research project), and a term paper (also based on the research project). We will meet several times early in the fall to discuss effective seminar presentations, statistical analysis and effective scientific writing.

**Prerequisites** – Biol 1115 or 1116 plus a minimum of 3 credit hours from Biol 2403/3, Biol 2451/3, Biol 3602/3, Biol 3603/3 or Biol 3492/3. Students must also have completed a minimum of 21 credit hours in Biology or obtain permission from the instructor.

<b>Undergraduate Assessment</b>	<b>Marks</b>
Field Course Proposal “Presentations”	5
Field Course Participation (including journal discussions)	10
Seminar (Fall term)	30
Research paper first draft (due middle of fall term)	15
Research paper final draft (due at end of Fall term)	40
<b>Total</b>	<b>100</b>

## **ACADEMIC REGULATIONS AND POLICIES**

It is your responsibility to be familiar with the information on Academic Regulations and Policies, Section VII of the 2009-10 Calendar which can be found on the University’s website at <http://www.uwinnipeg.ca./index/calendar-calendar>. This section covers classroom regulation, grading, transcripts, challenge for credit, academic standing, student discipline (academic and non-academic misconduct), appeals including grade appeals, University Policies and Codes, graduation.

A summary of important information regarding Academic Misconduct follows:

### Forms of Academic Misconduct:

- Plagiarism: includes presenting other people’s published or unpublished work in part or as a whole as your own. This includes material from lab manuals, essays, journal articles, books, etc. Plagiarism also refers to submitting the same work in more than one course without both instructors’ permission and to the situation where two or more students submit identical (or nearly identical) work for evaluation when the work was to be completed individually (p 4- 5).
- Cheating : includes copying another person’s answer on a test, communicating with another person during a test or exam, consulting unauthorized sources(including written and electronic sources), obtaining a copy (of all or part) of a test/exam/assignment before it is officially available, purchasing tests, essays or other assignments and submitting the work as your own (p 5).
- Improper Academic/Research practices include: fabricating or falsifying results, using other peoples’ research findings without permission, misrepresenting research results or methods, referring to non-existent sources or investigators, contravening the University’s Policy and Procedures On Research Integrity (p 5).
- Obstructing academic activities of another person; for example interfering with another person’s access to pertinent resources or information to gain academic advantage (p 5).
- Impersonation: both impersonation of another individual or allowing someone to impersonate you (p 5).
- Falsification or Modification of an Academic Record: including tests, transcripts, letters of permission, etc (p 5).
- Aiding and Abetting Academic Misconduct (p 5).

### Penalties for Academic Misconduct (p 5):

Can include, but are not limited to:

- Written warning
- Lower or failing grade on an assignment or test
- Lower or failing grade in a course
- Denial of admission or readmission to the University
- Forfeiture of University awards or financial assistance
- Suspension from the University for a specified period of time
- Withholding or rescinding a UW degree, certificate or diploma
- Expulsion from the University

### Procedures:

All allegations of academic misconduct must be reported initiating a process which involves several

steps. These include procedures involving the instructor of the course in which the misconduct is alleged to have occurred, the Departmental Review Committee, and the Senate Academic Misconduct Committee. See pages 5 through 7 for a detailed description of the procedures. These pages also outline the Appeals process regarding Academic Misconduct.

**VOLUNTARY WITHDRAWAL** (Please refer to Section III – Registration at the University's website, <http://www.uwinnipeg.ca./index/calendar-calendar> for Voluntary withdrawal procedures (p. 4)

**\*\*You must formally withdraw from a course. If you simply stop going to classes, you may receive an "F" on your transcript and loss of tuition credit.**

Please note the following deadline dates for voluntary withdrawal from Biology Courses:

**October 30, 2009** for 3 credit hour courses beginning Sept. 9, 2009 and ending Dec. 1, 2009

**January 22, 2010** for 6 credit hour courses beginning Sept. 9, 2009 and ending Apr. 5, 2010

**March 5, 2010** for 3 credit hour courses beginning Jan. 5, 2010 and ending Apr. 5, 2010

### **SERVICES FOR STUDENTS WITH DISABILITIES**

Students with documented disabilities requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., access to volunteer note-takers) are encouraged to contact the Coordinator of Disability Services (DS) at 786-9771 to discuss appropriate options.

Specific information about DS is available on-line at <http://www.uwinnipeg.ca/index/services-disability>.

All information about disability is confidential.

### **Possible project ideas for 4602...**

1. What is the relationship between personality and MR in voles?
2. Is there a relationship between MR and recapture rates of voles?
3. Is there a relationship between personality and recapture rates or home-range size of voles?
4. How much variation is there in MR among species of small mammals?
5. What is the effect of vegetation or habitat type on small mammal capture rates?
6. What is the preferred microclimate of yellow warbler nests?
7. What is the effect of weather patterns on torpor expression by hoary bats
8. Does moon phase influence activity of bats, small mammals?
9. What is the homerange size of hoary bats? Can we even tell using the telemetry techniques available to us?
10. Do weather patterns or moon phase influence activity of white-tailed deer?
11. What influences activity patterns of red squirrels?
12. Insect projects? – easy to generate massive amounts of behavioural data...

Many many more.... Watch animals for awhile and then use your imagination!