**Bio 3435G Animal Ecology**
(last updated 5 January 2018)

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**Email is the best way to connect with the instructor and TAs**

*Course description from the Academic Calendar: The life history consequences of behavioral, physiological, and morphological adaptations. Ecological aspects of reproduction and growth. Energetics and the use of physiological indices in ecological studies.*

*2 lecture hours, 3 laboratory hours, 0.5 course.*

Natural and human-induced environmental variability is a problem faced by all animals, and is especially profound in this era of rapid global change. In the field of individual-based ecology, the goal is to understand and predict how individuals will cope with environmental change. This requires an understanding of the behavioural and physiological strategies used by animals, learned through careful integration of fundamental facts, basic concepts and theories, and appropriate quantitative approaches.

In Animal Ecology, we will use this framework to study key concepts in contemporary individual-based ecology: climate and environmental periodicity, types of habitat, limiting factors and the ecological niche concept, habitat selection models, territoriality, ecological traps, movement, dispersal, migration, managing time and energy, growth and bioenergetics, and physiological flexibility. Labs will integrate field-based and quantitative approaches in the study of individual variation in ecological settings. For the essay requirement, students will write a 2500 word popular article.

Animal Ecology is highly recommended for students who have a strong interest in ecology, behaviour, evolution, and/or environmental science.

## Learning Outcomes

As a result of learning lecture material and practicing activities covered in the lab, students should be able to:

- Describe how environmental factors interact with individual-level processes (e.g., habitat selection, movement, physiological requirements) to determine a species' ecological niche and distribution in space and time
- Explain basic principles of individual-based ecology using accurate ecological and evolutionary terminology
- Apply ecological principles to make predictions about unfamiliar situations
- Use statistical analysis software to import data, manage data, perform basic summary statistics, perform standard statistical tests (e.g., t-test, ANOVA, correlation, regression), and generate simple maps

- Use computer software to model and visualize simple types of animal movement
- Independently collect, analyze, and interpret data and concepts and communicate these results in written form

**Prerequisite**

Biology 2483A Ecology.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

**Course Materials**

**Required -** Beckerman, A.P., and O. L. Petchey. 2012. Getting Started with R: An Introduction for Biologists. Oxford University Press, Oxford, UK – *available for purchase at the Bookstore*.

A laptop is highly recommended for some labs.

Students should check OWL (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

**Rooms**

Lectures will be held in BGS 0165: Mondays and Wednesdays 1:30-2:30 pm

Labs will be held in BGS 2077:
Section 002 – Monday 8:30-11:30 am
Section 003 – Monday 2:30-5:30 pm
Section 004 – Tuesday 8:30-11:30 am
Section 005 – Tuesday 2:30-5:30 pm

**Methods of Evaluation**

Feb 5,6: **Assignment 1** due at beginning of your lab (hard copy).
Feb 26: **Midterm** in class.
Mar 5,6: **Assignment 2** due at beginning of your lab (hard copy); in-lab **Writing Workshop.**
Mar 19,20: **Fact Sheet** due at beginning of your lab (hard copy).
Apr 4: **Assignment 3** due at beginning of lecture (hard copy).
Apr 9: **Popular Article** due at beginning of lecture.

**Grading Scheme**

Midterm: 15% (short answers)
Lab Assignments: 20% (3 written assignments worth 5%, 5%, and 10%)

Writing Workshop: 5% (participation grade)
Fact sheet: 5%
Popular Article: 20% (you must receive a passing grade on this assignment to pass the course)
Cumulative final exam: 35% (short answers)

The midterm and final exam will include questions from the labs (i.e., content covered in the lab manual and sections of "*Getting Started with R*").

Missed requirements: there is one pre-scheduled midterm makeup; if this makeup is missed, the final exam will be worth 50%. There will be one makeup lab time for the field labs; if this makeup is missed, grades will be reallocated to the other lab assignments. Accommodations will only be granted for the Popular Article if there is an excuse for absence during March 29 – April 5 (therefore, a maximum one week extension).

Late assignments will be docked 1% (off final grade) per day (24 h). For example, if you hand in the Popular Article two days late, it will be graded out of 23 instead of 25.

**Class Components**

**Lectures**

Individual-based ecology spans across ecology, behavioural ecology, and quantitative ecology, and as a result, there is no single, best textbook. You will only be responsible for material covered in lectures and labs, and you will be responsible for taking complete notes. Skeleton Powerpoint slides will be posted in advance (available the night before lecture). Students are expected to attend and take notes on all lectures.

**Labs**

Lab material and assignments will be posted on Owl. The labs will focus on the collection and analysis of data and the modeling of individual-based behaviour. Field-based labs will use the goldenrod-gall fly system and R statistical analysis software to analyze data. Modelling labs will use NetLogo to explore how individual behaviour scales up to have population-level consequences. Students are expected to attend and fully participate in all labs. Most labs are self-directed.

**Popular Article**

The essay assignment is to write an interesting story about the life of an animal species that spends at least part of its life in Canada. A title and list of 5 facts is due in March as is worth 5%. The final project is worth 20%. Specific guidelines will be posted on Owl. Following Senate regulations for a 3000-level essay course (G designation), the word limit is 2500.

**Useful Supplementary Texts**

Barnard, C. 2004. Animal behaviour: mechanism, development, function and evolution. Pearson/Prentice Hall, Toronto, ON.

Booth, W.C., G.G. Colomb, and J.M. Williams. 2008. The craft of research. 3rd edn. The University of Chicago Press, Chicago, IL.

Godin. J. J. (ed). 1997. Behavioural ecology of teleost fishes. Oxford University Press, New York.
Kingsolver, R.W. 2006. Ecology of campus: lab manual. Pearson Education, Toronto, ON.
Krebs, C.J. 2009. Ecology (6th edn). Benjamin Cummings, Toronto, ON.
Krebs, J.R., and N.B. Davies (eds). 1978. Behavioural ecology: an evolutionary approach. Sinauer Associates, Sunderland, MA.
Krebs, J.R., and N.B. Davies (eds). 1991. Behavioural ecology: an evolutionary approach. Blackwell Scientific Publications, Boston, MA.
Nordell, S.E., and T.J. Valone. 2014. Animal behavior: concepts, methods, and applications. Oxford University Press, New York.
Railsback, S.F., and V. Grimm. 2011. Agent-based and individual-based modeling: a practical introduction. Princeton University Press, Princeton, NJ.
Smith, T.M., R.L. Smith, and I. Waters. 2014. Elements of ecology: Canadian edition. Pearson Education, Toronto, ON.

**Conduct**

I expect professional conduct from all students, and in turn, you can expect professional conduct from me and the TAs. This includes doing your own work, helping others during lab times, and not disrupting others during class. You may use your laptop to take notes in class, but not for other activities. No e-mailing, texting, social networking, checking websites (unless I request you to), watching videos, etc. These activities are distracting to others in the class who can see your screen.

In e-mails, please put "Bio 3435" in the subject line and use your uwo.ca account. To ensure a speedy response, be considerate and professional in your e-mails; harassment will not be tolerated. Begin your e-mail with a salutation ("Dear Dr. Morbey") and end with an identifier of who you are ("Jane"). Remember that these are permanent records of your interactions with your professors and TAs. E-mails will be answered on a first come, first served basis and every attempt will be made to respond within 3 working days. Do not expect a response outside of regular working hours, on weekends or holidays, or within 3 days of an exam (before or after).

You may use non-sanctioned apps for course-related discussion, but do remember that these are not monitored by me or my TAs, and their focus may miss the mark when it comes to how you are assessed in the course.

**Academic offences**

You are responsible for reading and understanding university policies and terminology related to academic misconduct. Note that answers that are submitted in response to a question on a previous year's assignment, rather than this year's assignment, will not receive any credit. Making up data constitutes academic fraud.

"Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: **http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf."** Examples of scholastic offences include copying answers, plagiarism, and submission of your work for credit in multiple classes. Cheating- and plagiarism-checking software will be used to check for unusual coincidences in answers:

"Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating."

"All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software (Turnitin) under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com"

Any accusation of academic misconduct will be made on a case-by-case basis and will be based on all evidence that can be gathered (including incriminating activity on non-sanctioned apps). **All cases of academic misconduct will be reported to the Undergraduate Chair in the Department of Biology**. The penalty for an academic offence will be determined on a case-by-case basis. Academic offences come with the maximum penalty of failing the course and a permanent record in your transcript.

**Accommodation**

If you are unable to meet any course requirement because of medical or personal reasons or a heavy exam load (i.e., 3 exams in 23 hours), you must obtain valid medical or other documentation and provide it to an Academic Counselor (located in the Dean's office of your faculty) as soon as possible. **You also must inform me within 48 hours of the deadline**. Without approval from an Academic Counselor, you will receive 0% for the missed requirement. In the event of a missed final exam, you will require a "Recommendation of Special Examination" form the Dean's office. For further information see: www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

For a missed midterm, there will be one chance at a make-up exam at a pre-scheduled time. If the make-up exam is missed for a valid reason, the 15% will be re-allocated to the final exam. For a missed final exam, there will be one chance at a make-up exam in early May. If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

For missing the deadline for the Popular Article because of a medical or other serious excuse (with Academic Counselor's approval), an appropriate extension will only be granted for approved absences during April 3 – April 9.

**UWO Accessibility Statement**

Please contact me if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. I may direct you to the Services for Students with Disabilities (SSD) at 661-2111 x 82147.
www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

**Statement on Use of Electronic Devices**

Non-programmable calculators will be allowed during the midterm and final exam, but no other electronic devices.

**Support Services**

Registrarial Services: http://www.registrar.uwo.ca

In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Student Support Services http://westernusc.ca/services/

Learning skills services at the Student Development Centre: http://www.sdc.uwo.ca

"Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help."

The policy on Accommodation for Students with Disabilities can be found here: www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here:http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

**Appeals**

Grades are earned and, in the interest of fairness, additional points will not be granted because you need a certain GPA or because you expected better performance. I will round grades to the nearest integer (79.5% will become 80%; 79.4% will become 79%). I will let you know in class when graded exams and assignments will be available for viewing. See UWO's policies on academic appeal for further information.

**About this Course**

This course is supported, in part, by the Science Student Donation Fund. If you are a BSc or BMSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing paperwork in the Faculty of Science's Academic Counselling Office. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the chair of the department or email the Science Students' Council at ssc@uwo.ca.