



Bio 3435G Animal Ecology

(last updated 21 December 2019)

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Room 2074, BGS Building

Office hours: Thursdays, 9:00-11:00 am

TAs: TBA

Rooms & Schedule

Lectures: NCB 117: Mondays and Wednesdays, 1:30-2:30 pm.

Labs: BGS 2077:

Section 003 – Monday 2:30-5:30 pm

Section 004 – Tuesday 8:30-11:30 am

Section 005 – Tuesday 2:30-5:30 pm

Attendance is mandatory for lectures and labs. In some cases, lab sections may be subdivided into smaller groups and will take place over shorter time periods (1 h or 1.5 h instead of 3 h).

Course Description

Environmental variability is a problem faced by all animals, and is especially profound in this era of rapid global change. In ecology, a priority is to understand how individuals handle environmental variability, and then use this information to make predictions about how populations will respond to environmental change. This requires an understanding of the behavioural and physiological strategies used by animals, learned through the study of ecological principles and the application of quantitative methods (theory, modelling, and data analysis).

In Biology 3435G, this framework is used to teach key concepts in contemporary individual-based ecology: limiting factors and the ecological niche, habitat selection, ecological traps, habitat selection, territoriality, movement, dispersal, migration, growth and bioenergetics, and physiological flexibility. Lectures and readings will cover the principles. Different from most other Biology labs, labs will emphasize quantitative methods and will largely be self-directed.

In Biology 2483A (Ecology), students were introduced to basic ecological principles across the ecological hierarchy (from the individual to the ecosystem level) in all forms of life. Students in Biology 3435G will dig deeper into concepts operating at the individual level, will focus on animals, and will be introduced to the practice of quantitative methods in ecology. This fundamental knowledge will provide the foundation for more advanced courses in ecology, both at the undergraduate level (e.g., our 4000-level ecology courses and field courses) and graduate level.

2 lecture hours, 3 laboratory hours, 0.5 course.

Learning Outcomes

As a result of comprehending all lecture, lab, and reading material through studying and practice, students should be able to:

- Discuss 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 the core principles of individual-based ecology using accurate ecological and evolutionary terminology and use these principles in other courses and contexts
- Apply individual-based ecological principles to make predictions about unfamiliar situations (e.g., consequences of climate change)
- Use software to import data, manage data, perform summary statistics, perform standard statistical tests (e.g., t-test, ANOVA, correlation, regression), and generate simple figures
- Use computer software to model and visualize simple types of animal movement
- Independently collect, analyze, and interpret data and communicate these results in written form

Course Grades

Typical of a 3000-level course with 80-100 students, course grades in Biology 3435G show a strong correlation with overall GPA. Thus, the content is not particularly "easy" nor "hard". In previous years, the average course grade was in the low to mid 70s with a few students achieving grades in the low 90s.

The Department of Biology reserves the right to adjust final grades.

Prerequisites

The formal prerequisite for this course is Biology 2483A (Ecology) and Biology 2244A/B with at least 60%.

Unless students have either the prerequisite for this course or written special permission from an Academic Counsellor to enroll in it, they will be removed from this course and it will be deleted from their record. This decision may not be appealed, and students will receive no adjustment to their fees.

Basic statistical knowledge and application of this knowledge will be presumed. This includes the following concepts: experimental unit, replication, sample size, mean, median, standard deviation, standard error, normal versus non-normal distribution, parametric versus non-parametric statistics, correlation, linear regression, t-test, paired t-test, ANOVA, ANCOVA, histogram, box plot, and x-y plot. Students should ensure they are comfortable with these concepts.

There are no specific Math or Computer Science course prerequisites. The majority of modules containing Biology 2483A require 1.0 course in 1000-level math courses, which is more than adequate preparation for this course. In terms of Computer Science, any previous exposure to programming would be helpful but no background coding or programming experience will be presumed. Students should ensure they are familiar and comfortable with the following computer concepts: file extensions, delimiters in text files, directories, path names, and use of a wild card (e.g., the symbol *). Students should also be able to: download and save files to a local directory, use formulas in Microsoft Excel, save an Excel worksheet to a comma delimited text file (*.csv), and install software on their computer.

Course Materials

Required – Biology 3435G Lab Manual 2020 – *available for purchase from the Bookstore.*

Required - Beckerman, A.P., D.Z. Childs, O.L. Petchey. 2017. *Getting Started with R: An Introduction for Biologists*. 2nd edition. Oxford University Press, Oxford, UK – *available for purchase at the Bookstore on its own or bundled with Bowman et al. 2018.*

Required – Bowman, W.D., S.D. Hacker, M.L. Cain. 2018. *Ecology*. 4th Edition. Sinauer Associates, Sunderland, MA. – *available for purchase bundled with Beckerman et al. 2017. Alternatively, may be purchased as an ebook from a third-party ebook provider.*

A laptop is necessary for some labs although sharing is an option.

OWL (<http://owl.uwo.ca>) is the only method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

Methods of Evaluation & Due Dates

Jan 13,14:	Pre-lab practical (1%)
Jan 27,28:	Assignment 1 due at end of lab (4%)
Feb 14:	Assignment 2 due at 4:30 pm (10%)
Feb 26:	Midterm in class (15%).
Mar 23,24:	Assignment 3 due & in-lab practical assessment (10%)
Mar 27:	Writing Skills paragraph and Annotated Bibliography due at 4:30 pm...
Apr 3:	...SAR Article due at 4:30 pm (25%)
TBA:	Final Exam (35%).

Holiday travel should be scheduled after the final exam schedule is released.

Additional Details About Assessments

Midterm: 45 minutes, short answers, may cover lecture and lab material

Annotated Bibliography& SAR Article: a passing grade on this assignment is required to pass the course

Final exam: cumulative, 3 hours, short answers, may cover lecture and lab material

The midterm and final exam cover all course material, including material from lectures, labs (i.e., content covered in the lab manual and sections of *“Getting Started with R”*), and readings.

Late assignments without accommodation will be penalized 1% (off final grade) per day (24 h). For example, if the SAR Article (worth 25%) is handed in two days late, it will lose 2 marks out of 25. If an assignment (worth 5%) is handed in two days late, it will lose 2 marks out of 5.

Class Components

Lectures

Students are responsible for taking their own detailed notes and doing the required readings. The Powerpoint slides (in *.pdf version only) will be posted after the lecture. Recording lectures (and/or re-posting recordings via any electronic form) will not be permitted.

Labs/Workshops

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, Excel to store data, 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 engage in all labs. Most labs are self-directed with support from the TA. Lab activities are completed by individuals. In some labs, students may need to collect data in a group. In these cases, each student is expected to gain competency in all the group activities (e.g., measurements, data entry, preparing Excel files). Lab assignments must be completed by individuals; class mates may help by providing tips on how to get to an answer, but not by providing the actual answers. Individual learning and skill acquisition will be assessed in assignments and exams.

Annotated Bibliography & SAR Article

The essay assignment for this course is to write an article on the ecology of a species at risk (SAR) in Canada and is worth 25%. Specific guidelines are available in the Lab Manual. Following Senate regulations for a 3000-level essay course (G designation), the word limit is 2500.

Getting Help

The TAs are available during lab times to answer questions and provide guidance on lab activities and assignments. TAs will also monitor and address lab questions posted to the forum on Owl. TAs should be emailed only if the content is of a personal nature.

Prof. Morbey is available to answer questions and provide guidance during office hours (see top of document). At other times, Prof. Morbey will monitor and address lecture/SAR Article questions posted to the forum on Owl. Prof. Morbey should be emailed only if the content is of a personal nature or is urgent (e.g., an announcement that needs to be made to the whole class).

Conduct

Professional conduct is expected from all students, and in turn, students can expect professional conduct and fairness from instructors and TAs. This includes doing independent work, helping others during lab times, and not disrupting others during class. Laptops may be used to take notes in class, but not for other activities. No e-mailing, texting, social networking, checking websites (unless requested), watching videos, etc. These activities are distracting to others in the class who can see other students' screens.

In e-mails, put "Bio 3435" in the subject line and only use your uwo.ca account. Be considerate and professional in e-mails; harassment will not be tolerated. Students should begin e-mails with a salutation ("Dear Prof. Morbey") and end with their name. Remember that these are permanent records of student interactions with instructors and TAs.

Forum and email questions will be answered on a first come, first served basis and every attempt will be made to respond within 3 working days (usually faster, but this depends on instructor and TA schedules). Do not expect a response outside of regular working hours, on weekends or holidays, or within 3 days of an exam (before or after). Check the forum before asking a question, because it may have already been answered.

The use of non-sanctioned apps for course-related discussion or sharing of information is not recommended. These sites are not monitored by instructors or TAs, and their focus will miss the mark when it comes to assessments. In addition, do not rely on old course material, as the content and structure of Bio 3435G is updated annually.

Academic Offences

Students 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 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). Instructors may have cause to investigate academic misconduct at any time, both during the term the course is offered or after the course is over, and may impact previously graded work. **All cases of academic misconduct will be reported to the Undergraduate Chair in the Department of Biology, and this may occur at any time during the course or after final grades are submitted and approved.** The penalty for an academic offence will be determined on a case-by-case basis by the Undergraduate Chair and/or Associate Dean

(undergraduate). Academic offences come with the maximum penalty of failing the course and a permanent record in a student's academic transcript.

Accommodation

Regular and self-reported absences for the midterm will write the make-up midterm exam. Self-reported absences which cover the date and time of an assignment deadline will get an automatic 48 h extension. For all other accommodation requests, if students 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), they must obtain valid medical or other documentation and provide it to an Academic Counselor (located in each Faculty's Office of the Dean) as soon as possible. **Students also must inform the course instructor within 48 hours of the deadline.** Without approval from an Academic Counselor, the missed requirement will be assigned 0%. In the event of a missed final exam, students require a "Recommendation of Special Examination" form. For further information see: www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

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 Annotated Bibliography or SAR Article if there is an excuse for absence within the seven day period prior to its due date. 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 the regular final exam is missed, students must contact their faculty's Academic Counselling Office as soon as possible. They will assess the student's eligibility to write the Special Exam (the name given by the university to a makeup Final Exam). Students may also be eligible to write the Special Exam if they are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

UWO Accessibility Statement

Please contact the instructor if course material is required in an alternate format or other arrangements would make this course more accessible. Students may be directed to the Services for Students with Disabilities (SSD) at 661-2111 x 82147. www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

Statement on Use of Electronic Devices

Non-programmable calculators may 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 when students need a certain GPA or expect a better grade. Course grades will be rounded to the nearest 0.1 then to the nearest integer (79.45% will become 80%; 79.44% will become 79%). Times when graded exams and assignments will be available for viewing will be announced and will conform to departmental policy. 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.