Western Science

Department of Biology

# Biology 3445F Course Outline

## 1. Course Information

**Course Information**
Biology 3445F – Community Ecology
Lectures: Monday and Wednesdays, 12:30 pm – 1:30 pm ([redacted]).
Labs: Section 002: Thursdays, 2:30-5:30 pm ([redacted])
Section 003: Wednesdays, 2:30-5:30 pm ([redacted])
Section 004: Thursdays, 9:30-12:30 pm ([redacted])

**List of Prerequisites**
Biology 2483A – Ecology
Biology 2244A – Biostatistics with a minimum 60%.

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) 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.

## 2. Instructor Information

[redacted]

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. Please put '3445' at the beginning of the subject for all email correspondence, including to your TA. Please note, we cannot guarantee response to questions in the 24-hour period prior to assignment deadlines and exams.

## 3. Course Syllabus, Schedule, Delivery Mode

This course is an integrative approach to ecology, stressing the structure and function of ecological communities. Theoretical explanations for patterns of diversity, stability and productivity across a variety of spatial and temporal scales, and community types are evaluated in light of empirical evidence.

As a result of attending lectures, in assessments students should be able to:

- recognize typical patterns in ecological communities across space and time
- outline (categorize) and describe in words factors affecting the structure of ecological communities
- interpret the graphical presentation of ecological community data, often in relation to other biotic or abiotic factors
- recognize and apply theoretical principles of community ecology to scenario-based examples

As a result of participating in hands-on laboratory activities, students should be able to:

- recognize and measure ecological community response variables
- generate and manage community data using spreadsheets
- use statistical analysis software to import data, perform summary statistics, perform visualizations of the data, and perform standard descriptive and statistical tests for both univariate and multivariate data
- independently collect, analyze, and interpret data, and communicate these results in written form
- present an interpretation of results in a written form using support from the primary literature.

**Lecture Schedule**

Classes begin: September 5, 2024
Fall Reading Week: October 12-20, 2024
Classes end: December 6, 2024
Exam period: December 9 – 22, 2024

| **Section** | **Date** | **Lecture** | **Topic** |
|---|---|---|---|
| Introduction | Sept 9 | 1 | Introduction and course organisation |
| Section I: How do we study communities? | Sept 11 | 2 | Describing communities: richness, abundance, composition |
| | Sept 16 | 3 | Experimental design and common statistics: multivariate and ordinations |
| | Sept 18 | 4 | Common patterns: Intro to SADs, SARs, rank abundance, rarefaction, latitude, altitude |
| | Sept 23 | 5 | SARs: 3 hypotheses |
| Section II: Community assembly | Sept 25 | 6 | Niche vs Neutral: underlying themes (space / environment) and debates |
| | Sept 30 | National Day for Truth and Reconciliation (observed as a non-instructional day at Western) | |
| | Oct 2 | 7 | Community assembly: overview, niches: fundamental vs realised |
| | Oct 7 | 8 | Interactions: Competition, Predation, Facilitation |
| | Oct 9 | 9 | Island Biogeography Theory (target effect etc.) |
| | Oct. 12 – 20 | Reading Week (including Thanksgiving) | |
| | Oct 21 | **In-term test 1 (lecture 2-9)** | |
| | Oct 23 | 10 | Colonisation: space and dispersal – connectivity and corridors |
| | Oct 28 | 11 | Gradients and boundaries: distance decay models |
| Section III: Community Properties | Oct 30 | 12 | Metacommunities |
| | Nov 4 | 13 | Succession: communities over time |
| | Nov 6 | 14 | Interactions and Stability |
| | Nov 11 | 15 | Food webs & Trophic Cascades |
| Section IV: Community disassembly | Nov 13 | 16 | Disassembly: the process of extinction |
| | Nov 18 | **In-term test 2 (lecture 10-16)** | |

| | | | |
|---|---|---|---|
| | Nov 20 | 17 | Disturbance: IDH |
| | Nov 25 | 18 | Stressors: climate change, habitat loss, SLOSS |
| Section V: Consequences of Biodiversity Loss | Nov 27 | 19 | Biodiversity-Ecosystem Function relationships |
| | Dec 2 | 20 | Trait-based approaches and functional diversity |
| | Dec 4 | 21 | Ecosystem services and planetary boundaries |

**Lab Schedule**
Due to logistical considerations of your TAs, you must attend your own lab section. Your TAs are not required to explain background information that is presented in lectures prior to your lab sessions.

| Date | Lab # | Topics covered | Due in-class | Due online |
|---|---|---|---|---|
| Sept. 11-12 | | No labs | | |
| Sept. 18-19 | 1 | Plant communities: species area curves | data | |
| Sept. 25-26 | 2 | Stream invertebrates 1: sampling & site characterization | data | |
| Oct. 2-3 | 3 | Stream invertebrates 2: identification | data | |
| Oct. 9-10 | 4 | Coarse Woody Debris invertebrates: data collection | data | |
| **Oct. 16-17** | | **Reading Week (no labs)** | | |
| Oct. 23-24 | 5 | Introduction to community data in R; diversity indices and univariate statistics | | Assignment |
| Oct. 30-31 | 6 | RADs, accumulation curves, and richness estimators; Incorporating environmental and spatial data; SARs | | |
| Nov. 6-7 | 7 | **Open lab session - Help with class data analyses** | | |
| Nov. 13-14 | 8 | **Open lab session - Information about your lab report** | | Assignment |
| Nov. 20-21 | 9 | Introduction to multivariate data; Similarity matrices and common community ordination techniques | data | |
| Nov. 27-28 | 10 | **Open lab session - Help with final lab report** | | |
| **Dec. 2** | | **Final Lab Report due** | | Final report |

# 4. Course Materials

There is no textbook for this course. All course material will be posted to Brightspace. This is the primary method by which information will be disseminated to all students in the class, and students are responsible for checking Brightspace on a regular basis.

Proper clothing must be worn for all in-person labs (long pants, socks, closed-toed shoes). Some labs will be outside, please come prepared for rain, sun, wind, etc. and dress appropriately.

**Technical Requirements**
For labs working with data and performing statistical analyses, you must have access to a (laptop) computer with the following:

- Office suite with Word, Excel
- The statistical software R (https://cran.r-project.org/) and RStudio (https://rstudio.com/products/rstudio/download/). Both are available for free. Please ensure that

you have administrator access for your computer as you will need to install different R packages for different labs. **Note:** tablets are not functional computers for these labs.

# 5. Methods of Evaluation

The overall course grade will be calculated as listed below:

| | | |
|---|---|---|
| Lecture participation (10/11) | 5% | Half-sheets (0.5% each) |
| Lab participation (5) | 5% | In-class submission (1% each) |
| Lab assignments (2) | 10% | See lab schedule (5% each) |
| In-term test #1 | 15% | Oct. 21, 2024 |
| In-term test #2 | 15% | Nov. 18, 2024 |
| Laboratory report | 20% | Dec. 2, 2024 (see Notes on Evaluations) |
| Final exam (cumulative) | 30% | Set by registrar during exam period |

The final exam will be scheduled by the Registrar's Office during the December exam schedule.

**Important Notes on Evaluations**

- Lecture participation will be assessed using 'half-sheets'. These are a quiz-style learning tool that I use to demonstrate learner-centred progress. Monday class will start and end with a one question quiz. There are no marks associated with the answer, but you are expected to hand in half-sheets at the end of class for your 5% participation mark (0.5% each; 10/11 half-sheets will be graded/considered). **Weekly half-sheets cannot be made-up.**
- There are five (5) labs with hand-in class data; these are due prior to leaving your lab session for your 5% participation mark (1% each). Lab data is generated in groups and will be used in the final lab report for the class. **In-lab submissions cannot be made up. Labs are a mandatory component of the course.**
- The two lab assignments (5% each) are due via Brightspace submission prior to the beginning of the lab section that you are assigned (see lab schedule). Lab assignments help prepare you for the final lab report by providing feedback and opportunity for an improved grade on the final report. **You must hand in at least one of the two lab assignments (late penalty is 10% per day or part thereof (including weekends) and will not be accepted more than 4 days late). If you choose to miss an assignment submission the percent of your assignment grade will be carried over to your final lab report.**
- In-term tests will be during class hours and formal documentation is required for academic consideration. **Students must request academic consideration as soon as possible and no later than 48 hours after the missed test.**
- The final lab report is due via Brightspace submission on December 2nd, 2024. A no penalty late extension period will be granted up to and including December 6th, 2024 at 11:55pm. **Following that period, late lab reports will be penalized 10% per day or part thereof (including weekends) and will not be accepted after December 10th, 2024 at 11:55 pm.**
- All written assignments and the final lab report will be submitted to plagiarism detection software.
- This course is designated as an 'essay course' (i.e., with a suffix of E, F, G, or Z). The written lab assignments and final lab report are a compulsory component of the course. To satisfy the Senate requirement that students must demonstrate "some minimal competence in essay writing" in order to pass the course, **a passing grade (50%) on the combined weighted average of the written lab assignments and final lab report is required to pass the course**.

- A minimum average grade on the two midterm tests and final exam of 45% is required to pass the course to ensure that students demonstrate sufficient mastery of the learning outcomes.
- An overall weighted average grade across all assessments of 50% is required to pass this course.

# 6. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please note flexible deadlines and grading has been provided. However, in-term tests require formal documentation for academic consideration (as soon as possible and no later than 48 hours after the missed test); students will be provided a make-up test.

**Absences from Final Examinations**
If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (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" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

# 6. Accommodation and Accessibility

**Religious Accommodation**
When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

**Accommodation Policies**
Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf.

# 7. Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

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 their official university address is attended to in a timely manner.

Electronic devices will not be permitted on tests and exams except for base-model scientific calculators.

**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.

Biology 3445F is an essay-based course. Students must write their lab assignments and final lab report in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt by using quotation marks where appropriate (rare in science) and/or by properly paraphrasing and appropriately citing the source of the information. You are expected to know what plagiarism is at this stage of your programme.

All required papers (lab assignments and final lab report) will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking 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 (http://www.turnitin.com).

If tests and examinations in this course require on-line assessment (i.e., in the event of a Covid lock-down) they will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:
https://remoteproctoring.uwo.ca.

**Professionalism & Privacy:**

Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:

- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- Recordings are not permitted (audio or video)

**Land acknowledgment**

In this course, we acknowledge the historical and ongoing injustices that Indigenous Peoples endure in Canada, and we accept responsibility to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching.

Western University is located on the traditional lands of several First Peoples: the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples. This land continues to be home to diverse

Indigenous peoples (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society.
More information about Indigenous Services (https://indigenous.uwo.ca/) and Western University Land Acknowledgement (https://communications.uwo.ca/comms/land-acknowledgement/) are available.

# 8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Students who are in emotional/mental distress should refer to Mental Health@Western (https://uwo.ca/health/) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Learning-skills counsellors at the Student Development Centre (https://learning.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.

Additional student-run support services are offered by the USC, https://westernusc.ca/services/.