

GEOG 3224 B Spatial Ecology & GIS

Course Outline:

1. Course Information

1.1. Classroom Location and Time:

Lectures: Mondays, 12:30 – 14:30

Room: UC1110

Labs: Tuesdays, 14:30 – 16:30

Room: SSC1059

1.2. Contact Information:

Instructor: Jed Long

Office: SSC2405

Office Hours: Wednesday 13:00 – 14:00

Email: jed.long@uwo.ca

2. Calendar Description

2.1. Course Description

GIS methods for analyzing environmental and ecological data are presented. Emphasis is placed on quantifying and interpreting spatial patterns in data collected on plants and wildlife. The course will explore issues associated with scale, networks, disturbance, and feedback. Topics covered include habitat fragmentation, wildlife tracking, home ranges, and species distributions.

2 lecture hours, 2 lab hours, 0.5 course

Antirequisite(s): None

Prerequisite(s): GEOG2210 OR equivalent (e.g., BIOL2244 OR STAT2244); AND GEOG2220 OR GEOG2230.

Prerequisite checking is the student's responsibility.

2.2. Senate Regulations

Senate Regulations state, “unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will 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.”

3. Textbook

(Optional)

Gergel, SE and Turner, MG eds. (2017) Learning Landscape Ecology: A practical guide to concepts and techniques. 2nd Edition. Springer-Verlag, New York, NY.

Plus selected readings.

4. Course Objectives and Format

Course Objectives:

- I. Learn core concepts associated with spatial ecology, such as scale, networks, and disturbance
- II. Develop skills for implementing different spatial analyses in GIS
- III. Apply techniques using real-world data examples
- IV. Interpret spatial patterns observable in maps

This course will rely heavily on the development of technical skills and will use GIS software (e.g., ArcGIS) and statistical software (i.e., R), thus students should have some experience working with geographical data in GIS or related software environments.

Course Format:

Lectures: 2 hrs (lecture and applied demonstration; bring laptop if you can, not mandatory)

Labs: 2 hrs (in computer lab, demonstration and supported work time).

It is the student's responsibility to cover any material missed by failure to attend lectures, please also see all material on the course website.

Lecture Timetable

	Date	Topic
1	Jan 6	Course Introduction and GIS background
2	Jan 13	Species Mapping
3	Jan 20	Habitat mapping
4	Jan 27	Citizen science in ecology
5	Feb 3	Species Distribution Models I
6	Feb 10	Species Distribution Models II
7	Feb 17	SPRING BREAK NO CLASS
8	Feb 24	Beyond ArcGIS software
9	Mar 2	Landscape Patterns
10	Mar 9	Connectivity
11	Mar 16	Animal tracking data
12	Mar 23	Measuring wildlife space use
13	Mar 30	Spatial Ecology

Lab Timetable

	Date	Topic
1	Jan 7	No Lab
2	Jan 14	A1 – Species Range Maps
3	Jan 21	A1 – Habitat Maps
4	Jan 28	A1 – Help Session
5	Feb 4	A2 – Species occurrence maps
6	Feb 11	A2 – Species distribution models
7	Feb 18	SPRING BREAK NO LAB
8	Feb 25	A2 – Help Session
9	Mar 3	A3 – Landscape Patterns
10	Mar 10	A3 – Connectivity
11	Mar 17	A3 – Help Session
12	Mar 24	A4 – Animal Tracking Data & Home Ranges
13	Mar 31	A4 – Help Session

5. Learning Outcomes

- Understand key concepts in spatial ecology and GIS
- Assess datasets for quality and efficacy for different analyses
- Map and model species occurrence data
- Visualize and quantify animal movement and home range
- Quantify and interpret landscape patterns
- Evaluate habitat connectivity
- Perform spatial analysis in ArcGIS and R software

6. Evaluation

Evaluation Components	Weight (%)	Assessment Due Date
1. Assignment 1	15%	Friday, January 31
2. Assignment 2	15%	Friday, February 28
3. Assignment 3	15%	Friday, March 20
4. Assignment 4	15%	Friday, April 3
5. Group Discussion	10%	-
6. Final Exam	30%	-

All assignments will be submitted electronically (via OWL). Group Discussions will be scheduled and will be part of the Lectures.

Students are responsible for material covered in the lectures as well as the assigned readings.

Late assignments will face deductions at the rate of 10% per day late.

Grades will not be adjusted on the basis of need. It is important to monitor your performance in the course. Remember: *You* are responsible for your grades in this course.

7. Make-up Examinations

Makeups will be granted with approved documentation only. All documentation for missed exams must be provided the Academic Counselling Office and Instructor within 48 hours of the scheduled exam. For missed exams, you must take your documentation to Academic Counselling within 48 hours of the exam. Otherwise, the instructor will assign a grade of zero. The format and content of make-ups may differ substantially from the scheduled test or examination.

For missed assignments where students have used a self-reported absence. Students will be given a 4-day extension. For example if an assignment due Friday was missed due to a Self Reported absence, the assignment would then be automatically due on the following Tuesday.

Students who miss their Group Discussion assessment due to a self-reported absence will have the credit weight added to their Final Exam.

8. Use of Electronic Devices

No electronic devices will be allowed during tests and examinations.

9. Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

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.

10. Western's Commitment to Accessibility

The Department of Geography strives at all times to provide accessibility to all faculty, staff, students and visitors in a way that respects the dignity and independence of people with disabilities.

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2147 for any specific question regarding an accommodation. [Information regarding accommodation of exams](#) is available on the Registrar's website.

More information about "[Accessibility at Western](#)" is available.

11. Medical Issues

For Western's NEW [Policy on Accommodation for Illnesses](#) please refer to the Academic Calendar' section on [Academic Rights and Responsibilities](#).

Requesting Academic Consideration

Students who experience an extenuating circumstance (illness, injury, or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) Submitting a [Self-Reported Absence form](#) provided that the conditions for submission are met;
- (ii) For [medical absences](#), submitting a [Student Medical Certificate \(SMC\)](#) signed by a licensed medical or mental health practitioner in order to be eligible for Academic Consideration; or
- (iii) For [non-medical absences](#), submitting appropriate documentation (e.g., obituary, police report, accident report, court order, etc.) to Academic Counselling in their Faculty of registration in order to be eligible for academic consideration. Students are encouraged to contact their Academic Counselling unit to clarify what documentation is appropriate.

Students seeking academic consideration:

- are advised to consider carefully the implications of postponing tests or midterm exams or delaying handing in work;
- are encouraged to make appropriate decisions based on their specific circumstances, recognizing that minor ailments (upset stomach) or upsets (argument with a friend) are not normally an appropriate basis for a self-reported absence;
- **must communicate with their instructors no later than 24 hours** after the end of the period covered by either the self-reported absence or SMC, or immediately upon their return following a documented absence.

Academic consideration is not normally intended for the following circumstances:

- **Students who require academic accommodation based on an ongoing physical or mental illness (recurring or chronic) or an existing disability.** Students with an ongoing physical illness or mental disorder (recurring or chronic) or an existing disability are

responsible, in consultation with their doctors or other health professionals, to determine if they are capable of pursuing their studies and, if so, with what accommodations. Students are expected to seek and arrange reasonable accommodations with Student Accessibility Services (SAS) as soon as possible in accordance with the [Policy on Academic Accommodation for Students with Disability](#). Students with pre-existing accessibility plans arranged through SAS may not need to provide additional documentation when seeking academic consideration where such request for consideration relates to their disability and where their accessibility plans allow for coursework deferral or deadline extensions.

- **Students who experience high levels of stress related to academic performance** (including completing assignments, taking part in presentations, or writing tests or examinations). Students with academic or exam stress should access supports through [Student Health and Wellness](#) and [Learning Skills Services](#) in order to deal with this stress in a proactive and constructive manner. Mental Health

If you or someone you know is experiencing distress, there are several resources here at Western to assist you. Please visit Western's [Health and Wellness website](#) for more information on mental health resources.

12. Support Services

[Student Support Services](#)

[Student Development Services](#)

13. Important Dates

See Western's [Academic Calendar](#).