

**GEOG 439 (Catalogue # 1344)**  
**Analytical Methods in Geography II**

**Timetable:** Lec#01 WF 12:30 -13:45 SS541  
Lab #01 F 09:00 -11:00 SS 018

**Instructor:** Julia Linke  
Office: ES 904  
Office Hours: WF 14:00 – 15:00  
Phone: 210-8761  
Email: [jlinke@ucalgary.ca](mailto:jlinke@ucalgary.ca)

**TA:** Smita Tajne  
Office: TBA  
Office Hours: TBA  
Phone: TBA  
E-mail: [stajne@ucalgary.ca](mailto:stajne@ucalgary.ca)

**Course Calendar Description:**

Methods for the analysis of temporal, spatial and multivariate data sets. Emphasis is placed on data sets relating to geographic phenomena, resource utilization and environmental problems, with examples from the geographic literature. Examples will involve the use of computer packages.

**Course Prerequisite:**

Geography 339 or consent of the Department.

**Course Content:**

The goal of this course is to teach an array of analytical methods commonly applied in quantitative geographical research and other practical geographic applications. The materials will focus both on the statistical background and theory of these methods, as well as an understanding of the tasks and questions that can be addressed with each specific technique. Statistical background to be covered includes matrix algebra and basic statistical concepts such as probability theory, data distributions, sampling, and population inferences. Building on this basis, multivariate techniques for correlative analysis such as linear regression will be presented, with a focus on classical hypothesis testing, alternative model selection techniques, and goodness-of-fit evaluations. This course will also explore the true nature of multi-dimensional geographical data sets, and introduce techniques such as principal component analysis, factor analysis, discriminant analysis, and cluster analysis that represent practical strategies for dealing with data redundancy issues and rules for aggregating variables. Temporal and spatial aspects of geographical data analysis will be introduced, with a focus on techniques such as time-series analysis, ARIMA models, and spatial interpolation (kriging).

Course delivery will consist of bi-weekly lectures, weekly computer labs, readings, and a final group project. Guest lectures will be scheduled to provide specific examples of geographical analytical applications towards the end of the course. The laboratory reports are designed to provide hands-on experience with real geographical data sets, as well as a practical context for the theoretical knowledge delivered through lectures and reading material. In the final group project, students will be challenged to a) formulate a research question on a topic of their choice, b) perform a statistical analysis addressing and testing the formulated research question, and c) summarize and explain the nature of their findings. Successful project strategies will combine statistical knowledge with elements of critical thinking, project management, and teamwork: the foundation for future success in all aspects of geographical research and analysis.

### Required Texts:

Rogerson, P.A. 2001. Statistical Methods for Geography. Sage Publications Ltd., London

McGarigal, K., S.A. Cushman, and S.G. Stafford. 2000. Multivariate Statistics for Wildlife and Ecology Research. Springer-Verlag, New York.

Additional Materials will be available in pdf format either on blackboard or as paper copies in the collections room (Es 457).

### Grading (Weighting)

This course will be evaluated based the on three components: exams, laboratory reports, and a group project (see distribution of weight of grades below).

<u>Component</u>	<u>Individual</u>	<u>Total</u>
1. Exams		40 %
2 Midterm tests	20 % each	
2. Laboratory Reports		40%
	5% each	
3. Final/Group Project		20%
Project Proposal	5 %	
Written Report	10%	
Oral Presentation	5%	

The exams may constitute a combination of multiple-choice and short answer questions, and the dates for both exams will be announced in the first week of classes. The dates for the project proposal delivery and written report will also be announced in the first week. Oral presentations will be scheduled to occur during regular lecture time.

The laboratory reports should be clear and concise, but need to follow a standard format with an introduction, objective, methods, results and discussion/conclusion. Incompliance to this format will result in penalty of 25% of the final mark. Laboratory reports will be due one week after being assigned unless otherwise specified.

Exams, reports, and presentations will be evaluated on a numerical (percentage) basis. The overall course grade is calculated using the weights above, which is then converted to a letter grade using the grading system below.

Graded work will be handed out during lectures or it can be picked up during office hours. Graded laboratory work will be handed out at the beginning of each laboratory session or can be picked up during office hours of the Teaching Assistant.

There will be NO MAKE-UP EXAMINATIONS or ORAL PRESENTATION for students missing an examination for any other reason but medical with the appropriate documentation. Advance

notification is required for any other reasons to defer an EXAMINATION or ORAL PRESENTATION, and it will be at the instructor's discretion to find a suitable timing of the examination for the given student.

There will be two Midterm Examinations during the Winter term during regular lecture period. There is no final Registrar scheduled exam.

### **Final/Group Project:**

The final project is intended to be undertaken in student groups of two. The grades for the presentation and the project proposal will be applied equally to each project member, since both of these components will be a joint effort. Peer-evaluation may be used as a guidance to fairly distribute/weight the mark between the team members in a case of obvious discrepancy of individual effort. The final written report will be an INDIVIDUAL effort with own wording, discussion and presentation of results, and will therefore result in individual marks.

### **Grading System:**

96-100	A+	76-80.9	B	58-61.9	C-
90-95.9	A	71-75.9	B-	54-58.9	D+
86-89.9	A-	65-70.9	C+	50-53.9	D
81-85.9	B+	62-64.9	C	0-49.9	F

### **Attendance:**

Students attendance will not be documented for grading purposes to reflect active participation and are self-responsible for acquiring the information and understanding provided during lecture and laboratory times. An open and friendly classroom environment will be encouraged to facilitate the sharing of questions and the clarification and understanding of the topics under investigation.

### **Late Policy:**

Laboratory reports are due at the beginning of the lab session the following the assignment (unless otherwise specified) and are to be handed in to the Teaching Assistant. There are no exceptions based on reasons other than medical (requiring appropriate documentation) and late assignments will be subject to an immediate 10 % penalty followed by a 10% reduction in grade for each day thereafter (weekend and holidays included).

The same late policy will be applied to the project proposal and final project report.

## Plagiarism

Academic dishonesty is not an acceptable activity at the University of Calgary and students are **strongly advised** to read the Student Misconduct section in the University Calendar. Quite often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are 1) presenting another student's work as your own 2) presenting an author's work or ideas as your own without proper referencing and 3) using work completed for another course. This activity will not be tolerated in this course and students conducting themselves in this manner will be dealt with according to the procedures outlined in the calendar.

### Re: Posting of Grades and Picking-up of Assignments

- Assignments will be handed back only in class or by the Professor at pre-arranged time(s).
- To receive your assignment back via mail, please include an appropriately sized self-addressed, stamped envelope with your assignment when handing in to the professor.
- Posting of grades will be at the discretion of each Professor and, if posted, they will be scrambled. Grades will **not** be available at Geography's main office.

### Contact Information for Student and Faculty Representation

- SU VP Academic Phone: 220-3911 and e-mail: [suypaca@ucalgary.ca](mailto:suypaca@ucalgary.ca)
- SU Faculty Rep. Phone: 220-3913 and e-mail: [socialscirep@su.ucalgary.ca](mailto:socialscirep@su.ucalgary.ca)

### Campus Safewalk

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day, to any location on Campus including the LRT, parking lots, bus zones and University residences. Contact Campus Security at 220-5333 or use a help phone, and Safewalkers or a Campus Security officer will accompany you to your Campus destination.

"It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course."