Department of Geography

GEOG 639

ADVANCED SPATIAL ANALYSIS & MODELING
SPRING – 2005 H(3-3)
CATALOGUE #: 1921, AREA III

Course Information

Lectures:

Lec 20	Tuesday, 9:00am — 12:00pm, ES 920
	Thursday, 9:00am — 12:00pm, ES 920

Laboratory:

Lab 20	Tuesday, 2:00pm — 5:00pm, ES407
	Thursday, 2:00pm — 5:00pm, ES 4070
Lab 21	Wednesday, 9:00am — 12:00pm, ES407
	Friday, 9:00am — 12:00pm, ES 4070

Instructor: Andrew Hunter
Phone: 220-8785
Office: Engineering, Block F-124
Email: ahunter@ucalgary.ca

Teaching Assistants: Ping Wang
Email: pwan@ucalgary.ca

Yunliang (Phillip) Meng
Email: ymeng@ucalgary.ca

Office Hours: TBA

Course Outline

This course covers the analysis and comprehension of spatial stochastic processes. Geographical analysis has always concerned itself with spatial processes and spatial variation, but only recently has the discipline become fully aware of the inherent properties of space and spatial processes, that, affecting the statistical properties of spatial data, render most of the traditional analytical tools inefficient, if not unreliable. The scope of the course is to provide students with the analytical tools to understand spatial phenomena and to stimulate their critical thinking about space and spatial processes. The

most recent conceptual and computational developments will be considered, and diverse applications will be studied using state of the art software.

Core Objectives

The overall objective of this course is to provide the student with:

- the background and foundation necessary for undertaking spatial analysis;
- some appreciation of the special problems raised by the use of geographic data;
- an introduction to some of the tools available for spatial analysis; and
- the opportunity to research, plan, design, implement and report on their own spatial statistic application

Blackboard

Blackboard will be used to disseminate course material, and for the submission of assignments, unless instructed otherwise. Blackboard can be accessed at http://blackboard.ucalgary.ca/.

Course Content

The course will cover the following topics (See the course Calendar for more details):

- Introduction to Spatial analysis;
- Spatial Processes;
- Point Pattern Analysis;
- Spatial Clustering;
- Spatial Autocorrelation;
- Spatial Interpolation Methods;
- GeoStatistics;
- Spatial Regression Analysis;
- Conceptualization of Space;
- Dynamic Modelling.

Student Assessment

Assessment of this course is in four parts.

Part 1	*Lab Assignments*	*Six assignments to be completed throughout the Semester.*
Part 2	*Essay*	*A Literature Review.*
Part 3	*Project*	*Proposal and project of your choice*
Part 4	*Exams*	*Two 75 minute exams covering all topics introduced throughout the course.*

The weighting of the marks will be as follows:

Part 1	*Lab Assignments*	*5% each (30% total)*
Part 2	*Essay*	*15%*
Part 3	*Project Proposal* *Project*	*5%* *20%*
Part 4	*Final Exam*	*15% each (30% total)*
	Total	***100%***

Class Participation is not formally graded, but students are strongly encouraged to share their ideas, contributions, and questions in class.

Students are allowed to work in small groups (2 – 4) on the lab exercises, but lab exercises and final project must be completed individually by each student. Lab exercises are due the week after the assignment (unless otherwise specified). See the assignment instructions for actual date and time for submission.

The final project should be viewed as an opportunity to perform an insightful spatial analysis on the research topic and data of every student's MGIS (or thesis) project. If this is not possible, other datasets can be used, but **it is strongly recommended** that the topic and data are relevant to the student's main research interests. It is my belief that only this choice will ensure an in-depth comprehension of your research question; optimal choice of the most appropriate spatial analysis technique(s); and full appreciation of the potential and critical issues of the selected analytical tool(s). A detailed guideline for the project requirements will be provided in class.

It is essential to pass all elements/components in order to pass the course as a whole.

Course Prerequisite

Consent of the Department.

Grading

A+	4.00	96.0 to 100%	Outstanding performance
A	4.00	90.0 to 95.9%	Excellent — superior performance, showing comprehensive understanding of subject
A-	3.70	85.0 to 89.9%	
B+	3.30	80.0 to 84.9%	
B	3.00	75.0 to 79.9%	Good — clearly above average performance
B-	2.70	70.0 to 74.9%	
C+	2.30	65.0 to 69.9%	
C	2.00	62.0 to 64.9%	Satisfactory performance — basic understanding of the subject
C-	1.70	59.0 to 61.9%	
D+	1.30	55.0 to 58.9%	
D	1.00	50.0 to 54.9%	Minimal Pass — marginal performance
F	0	< 50%	Fail

Late Policy

All course work must be submitted in order to receive a grade for this course. Assignments are due prior to the beginning of the following assignment and are to be submitted via Blackboard. There are no exceptions and those assignments handed in late will be subject to an immediate 10% penalty followed by a 10% reduction in grade for each day thereafter (weekend and holidays included). Medical related circumstances will require a note from a physician.

Required Text

No specific text is required for this course, however, the following text is recommended:

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

Other recommended texts include:

Bailey, T.C. & Gatrell, A.C. (1995) *Interactive Spatial Data Analysis* Addison Wesley Longman Ltd.

Cressie, N.A.C. (1993) *Statistics for Spatial Data* John Wiley & Sons, Ltd., New York.

Davis, J.C. (2002) *Statistics and Data Analysis in Geology* John Wiley & Sons, Ltd., New York.

Fotheringham, A.S., Brunsdon, C., & Charlton, M. (2000) *Quantitative Geography. Perspectives on Spatial Data Analysis* Sage Publications Ltd., London.

Griffith, D.A. & Layne, L.J. (1999) *A Casebook for Spatial Statistical Data Analysis: A Compilation of Analyses of Different Thematic Data Sets* Oxford University Press, New York.

Haining, R. (1997) *Spatial Data Analysis in the Social and Environment Sciences* Cambridge University Press, Cambridge.

Readings shall also be provided throughout the semester that supplement the lecture material.

Plagiarism/Cheating/Other Academic Misconduct

Academic dishonesty is not an acceptable activity at the University of Calgary and students are strongly advised to read the appropriate section in their Calendars (beginning on page 63). 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.

Posting of Grades and Picking-up of Assignments

Assignments will be handed back only in class, via Blackboard, or by the Instructor at pre-arranged time(s). Posting of grades will be via Blackboard at the discretion of the Instructor. Grades will not be available at Geography's main office.

Supplementary Fees

None. It is intended that all course material will be provided in digital form through Blackboard.

Contact Information for Student and Faculty Representation

SU VP Academic: Phone: 220-3911 or e-mail: suvpaca@ucalgary.ca
SU Faculty Rep.: Phone: 220-3913 or e-mail: socialscirep@su.ucalgary.ca

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.