MCGILL DEPARTMENT OF GEOGRAPHY

COURSE OUTLINE *(tentative, subject to revision)*

GEOG 202 **STATISTICS AND SPATIAL ANALYSIS** **Fall 2014**

Instructor: Dr. Lea Berrang Ford (Geography)

Time: Classes: Tues. 11h35-13h25 (section 1), Thurs. 14h35-16h25 (section 2)
Drop-in sessions for lab assignment support: TBA
Midterm: Friday, Oct. 17th, 8h35-9h55, Stewart Biology Building S3/3

Location: Burnside Hall computing laboratory, Rm 511

Office hours: Instructor: 14h30-16h00 Tuesdays
15h00-16h00 Wednesdays
10h00-11h40 Fridays
Or by appointment

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Required text: An Introduction to Statistical Problem Solving in Geography, 3rd edition
McGrew & Monroe (2014) Waveland Press. Approx. $30-40.

Options: Text available at the university bookstore (~$50-60), or available as an e-book rental (180 days) at http://www.coursesmart.com/9781478611196.
There are also a few copies available at the Schulich Library.

Note that older editions are different – you must use the 3rd edition only.

COURSE DESCRIPTION

The course is intended to introduce students to basic statistical concepts of spatial and non-spatial analysis. The emphasis is on understanding how to select an appropriate descriptive tool or analytical test for different types of data, how to conduct basic analyses using different statistical software packages, and how to interpret the output of analyses. Students will be introduced to basics concepts of spatial data and spatial data analysis.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Apply basic statistical and spatial analysis methods to simple research questions.
   - Understand data
   - Select an appropriate methods for analysis
   - Analyze data
2. Develop analytical reports to answer simple research questions.
   - Interpret statistical results
   - Present results
3. Develop confidence in numeric & spatial analysis.

INSTRUCTIONAL METHOD

This course is offered this year using a flip-teaching approach. Instead of 3 hrs of lecture per week plus 2-3 hours of lab, each student will attend a 2-hr in-class session, preceded by readings and on-line module work at home. The structure consists of the following 5 key components:

1. **On-line modules**: 2-3 hrs per week of pre-class preparation at home (readings, on-line module), based on on-line content available through MyCourses
2. **Quizzes:** Completion of a weekly on-line quiz (based on readings and module content) prior to each class. Quizzes can be completed on-line via MyCourses
3. **Class:** 2 hrs of problem-based, interactive class session per week
4. **Assignments:** Assignments done independently, but supported by drop-in lab support sessions.
5. **Option drop-in lab sessions:** Weekly drop-in sessions are available for students wanting support completing their assignments.

Students will have an opportunity to apply the content learned in readings and module content learned outside of class time during weekly in-class sessions with the instructor. Quizzes are designed to provide incentive and ensure that students come to class prepared and having completed on-line modules.

Lab sessions are drop-in, and will provide students with support in completing their assignments. The assignments introduce students to relevant software and application of concepts. Students are strongly encouraged to attend these sessions for support on software issues, data analysis and interpretation.

ASSIGNMENTS AND EVALUATION

Quizzes	10 %
Lab assignments	35 % *(see last page of syllabus for breakdown of marks)*
Mid-term Exam	20 % *(In class, during lecture)*
Final Exam	35 % *(Held during the scheduled exam period)*

Assignments

All assignments are due in class, at the beginning of class, as listed in the course schedule. Assignments submitted after the start of class will be considered 1 day late. Students who choose not to attend lab drop-in sessions are responsible for completing the assignment independently. For all assignments, assessment will be based not only for content, but also on structure, clarity, presentation and organization of material and results.

Quizzes

All quizzes must be completed by midnight the day prior to each respective class (i.e. Quiz 1 must be completed the night before the class scheduled for Module 1). Quizzes are completed on-line through MyCourses, and students are permitted up to 2 attempts (60 minutes maximum duration each) for each quiz. Requests for additional attempts will not be considered.

Late submission or requests for consideration

In fairness to those who complete assignments on time, late assignments will be penalized by 10% per day (including Saturday and Sunday), and will not be accepted after marked

assignments have been returned to other students. You must contact the relevant TA directly to arrange submission of a late assignment.

In cases of personal or academic difficulty, consideration may be given. Requests for consideration should be made well before the assignment due date, and must be accompanied by documentation with sufficient detail to describe whether a student can perform academic assignments and the duration of the problem (open-ended medical notes will not be accepted).

Excuses for missed assignments and examination will not be accepted, except in serious cases for which written proof from an appropriate authority must be provided to: (a) the instructor for the mid-term exam or assignments; (b) the Associate Dean of Science for the final exam. A student can have a deferred final exam only if approved by the Associate Dean. Requests for consideration of late submissions should be made to the instructor and not the TA.

COURSE CONTENT

This course focuses on basis spatial and non-spatial statistical analysis. We will begin the course by covering basic concepts in understanding datasets and probability distributions. The course focuses on helping students to *understand* their data, *describe* their data, *select* an appropriate statistical test, *use common software packages* to run that test, *understand* the output, and *interpret* results. The figure below provides a schematic of the key foci of the course. The second component of the course focuses more specifically on spatial analyses. Students will have the opportunity to learn and apply common spatial statistical techniques and use a number of freeware packages available for analysis. The statistical concepts and theories introduced in this course are equivalent to standard introductory statistics course credits.
What will not be covered in the course:

This is not a standard statistics course – we will not focus on calculation of equations or detailed mathematics of statistical theory. While brief forays into the equations and math behind statistical approaches can be useful, the course focuses on application and understanding. This is not an advanced spatial statistics course. Such courses usually require at least one prerequisite in basic statistics. GEOG 202 provides such a prerequisite (including introduction to statistics), but goes a little further by introducing spatial concepts and delving into some spatial statistics. This course will not cover basic GIS techniques, and we will not use standard GIS software (e.g. ArcGIS) during labs. For students particularly interested in the spatial aspects of analysis, a GIS course would be an excellent complement to GEOG 202.

IMPORTANT INFORMATION

Posting course notes on-line other than by the instructor is not permitted. Instructor generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Infringements of copyright can be subject to follow up by the University.

Academic Integrity: McGill values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest).

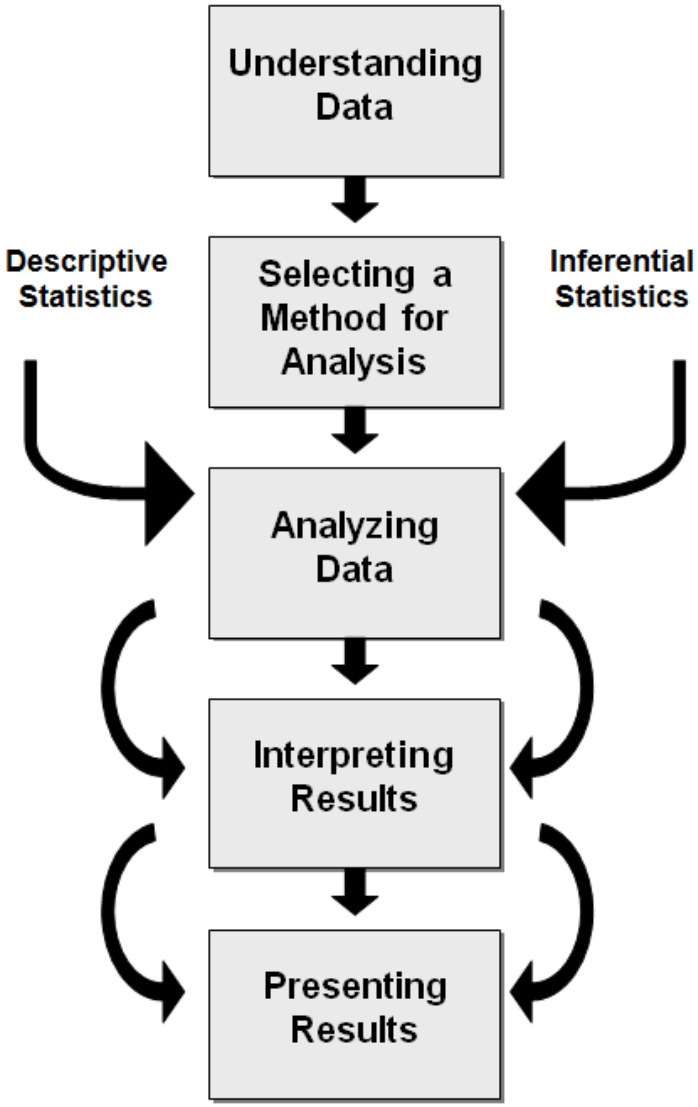
Language of Submission: In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

Student assessment: For information on university and department policies for student assessment, please go to http://www.mcgill.ca/geography/studentassessment

Student Support: If you have a disability, please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 398-6009 (online at http://www.mcgill.ca/osd) before you do this.

Course Communication: Communication to students will include regular postings on MyCourses.

Policies governing academic issues which affect students can be found in the Handbook on Student Rights and Responsibilities, Charter of Students' Right (online at http://www.mcgill.ca/files/secretariat/greenbookenglish.pdf).



COURSE SCHEDULE

M=Monday T=Tuesday W=Wednesday R=Thursday F=Friday

Week	Date (section 1)	Date (section 2)	Topic	Pre-class prep	Assignments/ Exams
Week 0	T2 Sept	R4 Sept	Introduction and basic terms & concepts	n/a	
Week 1	T 9 Sept	R11 Sept	Descriptive statistics	Module 1	
Week 2	T16 Sept	R18 Sept	The normal distribution and probabilities	Module 2	Lab 1 due Sept. 16/18
Week 3	T23 Sept	R25 Sept	Inferential statistics I	Module 3	Lab 2 due Sept. 23/25
Week 4	T30 Sept	R2 Oct	Inferential statistics II	Module 4	
Week 5	T7 Oct	R9 Oct	Introduction to spatial analysis	Module 5	Lab 3 due Oct. 7/9
Week 6	T14 Oct	R16 Oct	Mid-term review/prep	n/a	
Midterm (both sections): Friday, Oct. 17, 8h35-9h55, Stewart Biology S3/3					
Week 7	T21 Oct	R23 Oct	Spatial analysis I – Point data	Module 7	
Week 8	T28 Oct	R30 Oct	Spatial analysis II – Area data	Module 8	Lab 4 due Oct. 28/30
Week 9	T4 Nov	R6 Nov	Intro to correlation & regression	Module 9	
Week 10	T11 Nov	R13 Nov	Regression interpretation	Module 10	
Week 11	T18 Nov	R20 Nov	Spatial regression & GWR	Module 11	
Week 12	T25 Nov	R27 Nov	Conclusion & review	n/a	Lab 5 due Nov. 25/27

LAB SCHEDULE

Lab 1: Introduction to STATA, basic terms, and descriptive statistics (STATA)

Lab 1 is worth 4% of your final grade

Assignment posted on MyCourses: Sept. 9

TA available in lab: TBA

Lab 1 due in class in Week 2

Lab 2: Probability, sampling & estimation

Lab 2 is worth 4% of your final grade

Assignment posted on MyCourses: Sept.16

TA available in lab: TBA

Lab 2 due in class in Week 3

Lab 3: Inferential statistics (STATA)

Lab 3 is worth 12% of your final grade

Assignment posted on MyCourses: Sept. 23

TA available in lab: TBA

Lab 3 due in class in Week 5

Lab 4: Spatial analysis of point data (SatScan)

Lab 4 is worth 5% of your final grade

Assignment posted on MyCourses: Oct. 21

TA available in lab: TBA

Lab 4 due in class in Week 8

Lab 5: Spatial analysis of area data (GeoDa)

Lab 5 is worth 10% of your final grade

Assignment posted on MyCourses: Oct. 28

TA available in lab: TBA

Lab 5 due in class in Week 9