

**Subject to change**

## GEOG 2210B – Intro to Stats for Geographers Course Outline: Section 001, Winter 2023

This course is taught in-person

### 1. Course Information



	Delivery Mode	Day/Time	Location
<b>Lecture</b>	In person	<b>M/9:30-11:30 am</b>	<b>SSC 3022</b>
<b>Lab sec 2</b>	In person	<b>M/12:30-2:30 pm</b>	<b>SSC 1059</b>
<b>Lab sec 3</b>	In person	<b>M/2:30-4:30 pm</b>	<b>SSC 1059</b>
<b>Lab sec 4</b>	In person	<b>W/9:30-11:30 am</b>	<b>SSC 1059</b>

\*Details about design and delivery of the course are listed below in Section 6

Classes Start	Spring Reading Week	Classes End	Study day(s)	Exam Period
January 9	February 18-26	April 10	April 11 & 12	April 13-30

January 17, 2023: Last day to add a second-term half course

February 20, 2023: Family Day

March 7, 2023: Last day to drop a first term half course without penalty



Course Instructor	Contact Information	Office Hours
David Goldblum	Office: SSC 2403 david.goldblum@uwo.ca	Wednesday 2:30-3:30 pm, Thursday 10-11 am, or by appointment

Teaching Assistants	Contact Information	Office Hours
tbd		
tbd		



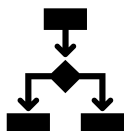
- Office hours will be held in-person, however one-on-one Zoom meetings can be arranged – email the instructor or TA.

## 2. Calendar Description

An introduction to the nature of geographical analysis of data and the application of statistical techniques and computing systems to in Geography: data collection, research design, sampling; models of spatial data, probability, distributions, hypothesis testing, correlations and regression.

2 lecture hours, 0.5 course

**Antirequisite(s):** [Biology 2244A/B](#), [Economics 2122A/B](#), [Economics 2222A/B](#), [Health Sciences 3801A/B](#), [MOS 2242A/B](#), the former Psychology 2810, the former Psychology 2820E, [Psychology 2811A/B](#), [Psychology 2830A/B](#), [Psychology 2850A/B](#), [Psychology 2851A/B](#), [Social Work 2207A/B](#), [Sociology 2205A/B](#), [Statistical Sciences 2035](#), [Statistical Sciences 2141A/B](#), [Statistical Sciences 2143A/B](#), [Statistical Sciences 2244A/B](#), [Statistical Sciences 2858A/B](#), [Statistical Sciences 2037A/B](#) if taken prior to Fall 2010.



**Prerequisite(s):** 1.0 course from [Geography 1100](#), [Geography 1200A/B](#), [Geography 1300A/B](#), [Geography 1400F/G](#), [Geography 1500F/G](#), [Geography 2131A/B](#), [Geography 2132A/B](#), [Geography 2133A/B](#), [Geography 2152F/G](#), [Geography 2153A/B](#), [Environmental Science 1021F/G](#); or enrolment in the Major in Physical Geography and Environment, in the Certificate in Geographic Information Science, or in an Honours Earth Science Program for Professional Registration.

Prerequisite checking is the student's responsibility

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

Required textbook: McGrew Jr., J.C., Lembo, A., and Monroe, C. (2014). *An introduction to statistical problem solving in geography*. Waveland Press: Illinois. 3<sup>rd</sup> Edition. ISBN: 9781478611196



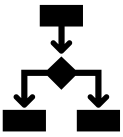
*The 2<sup>nd</sup> edition of this textbook would be acceptable:*

McGrew Jr., J.C. and Monroe, C. (2000). *An introduction to statistical problem solving in geography*. McGraw Hill: Boston. 2<sup>nd</sup> Edition. ISBN: 0697229718 [**Also on reserve at Weldon Library**].

Additional readings and materials will be placed on OWL (Course Readings)

## 4. Course Objectives and Format

The field of Geography is marked by diversity in subject matter, which includes physical (environmental), human (socio-economic), and integrated (human-physical) topics of inquiry. It is therefore not surprising to learn that there exists a variety of analytical methods which geographers employ. This course serves as an introduction to these analytical approaches, taking you from the collection and presentation of geographic data to analysis and interpretation. The course is targeted for undergraduate students in geography and related disciplines with limited backgrounds in statistical approaches to geographic problem solving. Analytical examples and problem solving will involve the use of statistical computer packages. Students will leave this course with knowledge and experience in statistics and an appreciation for how they are applied to geographic issues.



Attendance is not required, but it is strongly encouraged

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class.

Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#). [Using the right browser is important, especially when using different features integrated with OWL]

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

## 5. Learning Outcomes

Upon successful completion of this course, students will be able to:

- Distinguish and compare basic data types and characteristics, concepts, and strategies for data preparation, communication, and display
- Use tables and graphics to effectively summarize and communicate geographic data using spreadsheet and statistical software packages
- Understand, compare, and be able to apply basic descriptive statistics: measures of central tendency, dispersion, and distribution shapes
- Explain and employ basic probability theory, probability distribution functions, and problem-solving
- Explain and apply the framework for both classical and p-value hypothesis testing
- Explain basic concepts in estimation and apply towards confidence interval generation
- Identify and interpret the range of basic statistical tests common in an inferential, hypothesis-testing framework
- Explain and apply terms and concepts in hypothesis testing; one, two and three or more sample difference of means (both parametric and non-parametric tests)
- List, explain, and apply inferential categorical difference tests and spatial sampling techniques to geographic data
- Explain and apply tests appropriate to evaluate the statistical relationship between variables (both parametric and non-parametric tests).



## 6. Course Content and Schedule



Week	Dates	Lecture topic	Readings	Lab
1	January 9-13	Course Introduction & Geographic Data	Chapters 1 & 2	No lab
2	January 16-20	Descriptive statistics (non-spatial and spatial)	Chapters 3 & 4	Lab 1: Data basics and software
3	January 23-27	Descriptive statistics (spatial) & Probability	Chapters 5 & 6	
4	January 30-February 3	Basic elements of sampling	Chapter 7	Lab 2: Descriptive statistics
5	February 6-10	Estimation in sampling	Chapter 8	
6	February 13-17	Inferential Statistics and Hypothesis testing	Chapter 9	Lab 3: Probability and hypothesis testing
8	February 20-24	Reading Week	N/A	
7	<b>February 27-March 3</b>	<b>MIDTERM (February 27; 9:30-11:30 am)</b>	<b>Exam covers: Chs 1-9</b>	Lab 3: Probability and hypothesis testing
9	March 6-10	Two sample tests	Chapter 10	No lab
10	March 13-17	Three or more sample tests	Chapter 11	Lab 4: Difference tests
11	March 20-24	Categorical difference tests & Inferential spatial statistics	Chapters 13-15	
12	March 27-31	Correlation	Chapter 16	Lab 5: correlation and regression
13	April 10	Regression	Chapter 17	

## 7. Communication



- Check the OWL site frequently for announcements and course postings, but important announcements will be made in class, and it is your responsibility to attend lecture to receive that information.
- Students should email their instructor(s) and teaching assistant(s) using OWL “messages”
- For any other communication, 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 his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).
- Emails will be monitored daily; students will receive a response in 24 – 48 hours if not sooner

## 8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

Assessment	Format	Weighting	Due Date
Midterm Exam	In person	35%	February 27 (9:30-11:30 am)
Lab assignments (x5)	In person	25% (5% each)	Varies (see schedule)
Final exam	In person	40%	TBD

The evaluation methods described in the course outline are essential requirements for the course.

Students are responsible for material covered in both lectures and labs, as well as the assigned chapters/sections in the text. **To pass the course, students must achieve a passing grade ( $\geq 50\%$ ) on the exam component (midterm and final) of the course.**



All assignments are due at 11:55 pm EST on the due date unless otherwise specified

**Exams:** The Midterm and Final will assess material covered in both lecture, lab, and textbook. You will be expected to understand and explain statistical concepts, define terms, perform statistical calculations, and interpret statistical software output. The exams will be mixed formats: multiple choice, true/false, fill-in-the-blanks, short answer, definitions, calculations, and diagram questions

**Lab assignments:** There will be five lab assignments throughout the term. Electronic versions of all assignments will be available via OWL several days prior to the beginning of the laboratory session during which they are assigned. Lab assignments will be due before the start of the next lab via OWL submission. It is the student’s responsibility to ensure that completed assignments are properly uploaded to OWL. Graded exercises will be returned prior to the lab after they are due.

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work which is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

**Information about late or missed evaluations:**

For Western University Policy on Accommodation for Medical Illness and a downloadable Student Medical Certificate (SMC) see [Policy on Accommodation for Illness](#).



Students seeking academic accommodation on medical grounds for any missed exams and/or assignments worth 10% or more of their final grade **must** apply to the Academic Counselling office of their home Faculty and provide documentation. Academic accommodation cannot be granted by the instructor or department. If the midterm exam is missed, and the student was granted academic accommodation by their home Faculty, a make-up test will be offered.

For non-documented medical absences or non-medical absences, late assignments will be given a late-penalty of 25% per day for a maximum of four days. After four days the assignment will result in a mark of 0. For assignments worth less than 10%, the student must submit a request for accommodation to the instructor. Medical documentation will be required. Late assessments with illness self-reports should be submitted within 24 hours of submission of the last illness self-report

An assessment cannot be submitted after it has been returned to the class; thus an alternate assessment will be assigned OR the weight will be transferred to the final grade.

**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.**

**9. Accommodation Policies**

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: [Academic Accommodation for Students with Disabilities](#).

**Academic Consideration for Student Absence**

The University recognizes that a student’s ability to meet their academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in order to ensure fairness and consistency for all students, academic

accommodation for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation indicating that the student was seriously affected by illness and could not reasonably be expected to meet their academic responsibilities.

#### Policy on Academic Consideration for Medical Illness - Undergraduate Students

#### Student Medical Certificate (SMC)

#### **Religious Accommodation**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the [Western Multicultural Calendar](#).

### **10. Make-up Examinations**

Makeups will be granted with approved documentation only. All documentation for missed exams must be provided to the Academic Counselling Office within 48 hours of the scheduled 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.

### **11. Use of Electronic Devices**

No electronic devices except non-graphing calculators will be allowed during examinations. Phones are not to be used as a calculator during exams.

A calculator with basic functions is required for the laboratory exercises and the examinations. It is your responsibility to know how to use your calculator, and to ensure its functionality during examinations.

### **12. How to Be Successful in this Class:**

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Take notes as you go through the lesson material. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively.
4. Connect with others. Try forming a study group and try meeting on a weekly basis for study and peer support.
5. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).



### **13. Continuity of Education Plan (in-person class pivoting to online learning)**

In the event of a COVID-19 resurgence during the course that necessitates the university to direct courses move away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

### **14. Information on COVID-19**

#### **Masking Guidelines**

Students will be expected to wear triple layer, non-medical, paper masks at all times in the classroom as per University policy and public health directives. Students who are unable to wear a mask must seek formal accommodation through Western Accessible Education, and present medical documentation.

Students are not permitted to eat or drink while in class to ensure masks stay in place. Students will be able to eat and drink outside of the classroom during scheduled breaks.

Students unwilling to wear a mask as stipulated by Western policy and public health directives will be referred to the Dean, and such actions will be considered a violation of the student Code of Conduct.

#### **Course Absences due to Daily COVID Screening Questionnaire**

Missed assessments (e.g., presentations, essays, quizzes, tests, midterms, etc.) require formal academic considerations (typically academic counselling).

Methods for dealing with missed work and course content are at the discretion of the instructor(s). Students should be aware that some learning outcomes cannot be easily made up and may need to be completed in a subsequent year. Your instructor will provide you with further information as to how this applies within this course.

Students who demonstrate a pattern of routinely missing coursework due to self-reported COVID symptoms, and therefore do not demonstrate mastery of the learning outcomes of the course, will not receive credit for the course.

### **15. 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.

### **16. Western's Commitment to Accessibility**

The Department of Geography and Environment 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.

## **17. 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.

## **18. Support Services**

[Western's Support Services](#)  
[Student Development Centre](#)

## **19. Important Dates**

January 10: Classes resume

January TBA: Last day to add a second term half course

February 21: Family Day – Department Office Closed

February 21-25: Spring Reading Week (No classes; Department Office open)

March 7: Last day to drop a first term half course without penalty

April 8: Classes end

April 9: Study day

April 10-31: Examination Period

## **Program Learning Outcomes and Skills**

### **Learning Outcomes**

- ✓ Develop knowledge and critical understanding of the fundamental characteristics, processes, temporal changes and landscapes of social and biophysical systems and their interactions.
- ✓ Demonstrate informed awareness of geographical diversity through knowledge of different places and understanding of the processes that shape them spatially and over time.
- ✓ Combine breadth of knowledge of Geography with specialized understanding in selected sub-fields.
- ✓ Relate specialized understanding of the geography of bio-physical systems to knowledge and practices in environmental and natural sciences
- ✓ Critically reflect on the scope and intellectual development of the discipline of Geography

- ✓ Synthesize and evaluate geographical information from diverse sources, including geo-spatial data
  - ✓ Collect, analyze and interpret geographical and geo-spatial data in relation to social and biophysical systems
  - ✓ Describe, explain, analyze and interpret a range of geographical phenomena outside the classroom by engagement with people, places and environments
  - ✓ Analyze real-world problems and policy applications using geographical concepts, skills and understanding.
  - ✓ Communicate geographic ideas and understanding effectively to a variety of audiences in writing, orally, and graphically
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- ✓ Identify, analyze and interpret spatial patterns and processes of urbanization, financial and economic aspects of urban development, and processes in urban systems and built environments.
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- ✓ Develop and demonstrate applied skills in geo-spatial data visualization, design and communication.
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- ✓ Develop knowledge and practical skill with standard methods in GISci including geo-spatial data acquisition, interpretation, quantitative processing and analysis; geo-spatial databases; spatial modeling; and application to geographic problems.

### **Geographical Skills**

- ✓ Field and/or lab methods: including observation, data collection (of all kinds), mapping
- ✓ Technological skills (computer hardware, software, instrumentation) including use of geographical and data analysis software.
- ✓ Geographical data: statistical concepts, analysis and inference; quantitative and qualitative analysis; numerical and/or mathematical analysis; calculations; programming; problem solving.
- ✓ Map, remote sensing images and geo-spatial data interpretation and analysis
- ✓ Spatial thinking, spatial analysis & spatial processes of human and/or environmental processes (e.g. cultural, social, political, economic, scientific)

### **Generic Skills**

- ✓ Literature and secondary data sources: information search and retrieval, meta-analysis of published data, synthesis of information sources and literature, annotated bibliographies.
- ✓ Critical and reflective reading, listening, thinking.
- ✓ Writing – education and practice in writing essays, reports, notebooks.

- ✓ Visual presentation and graphical design: graphical design and production of : maps, diagrams, presentations, posters, web-based media
- ✓ Oral communication/presentation: -structured class discussions (seminars, small-group interaction, debates), individual and group presentations.
- ✓ Project planning, management and design: time management, independent major project, research proposals.
- ✓ Inter-personal skills: leadership, team facilitation