GEOG 2710: Introduction to Statistics in Geography Spring 2024-2025, 3 credits, Course #7686 MWF 10:45-11:40 am Morton 227 James Dyer 367 Clippinger <u>dyer@ohio.edu</u>; 740-593-1142 Office Hours: M 12:30-1:45 & W 12:30-3:15

Office hours are available in-person, or via Teams for the course. I'll assume in-person unless you let me know otherwise.

## TA:

Contact information for instructor and TA is also available on Canvas.

This course introduces the statistical methods used by geographers to analyze and interpret geographical data and solve geographical problems. Material in the course will provide you the skills to critically evaluate literature you encounter in your studies, and in day-to-day life. It will also provide you analytical tools to carry out your own research, such as Geography majors will do in GEOG 4800: Capstone Experience in Geography. Course topics include descriptive statistics, sampling design, probability, hypothesis testing, statistical association, correlation, and regression analysis.

## Required Textbook:

 Statistics for People Who (Think They) Hate Statistics (5th ed.), by Neil Salkind and Bruce Frey. Access is provided through Canvas, as part of the Digital Course Materials: Inclusive Access Program. The reduced cost of the book (\$43) is automatically billed to your account. You have the option of "upgrading" to a hard copy. (You can also opt out of the program and purchase the book on your own (\$142). (If you do, be sure to purchase the "Excel" version of the book.). You should read the assigned chapters before the topic is presented in lecture. See the Lecture and Reading Schedule below.

## Technology:

- We will use Canvas for downloading (and uploading) data and assignments. (PDFs of lectures are also posted there.)
- Activities, exercises, and quizzes/exams will be performed in-class, so **you will need to bring your laptop to each class session**. Talk to me right away if this presents a problem.
- Most of the assignments and activities will be performed using **Excel**, so you will need Microsoft Office on your computer (<u>not</u> through a web browser). There is a link to OIT on Canvas.
- Also on Canvas is a link for installing Excel's **Analysis ToolPak**, which you will need for many statistical tests.
- Finally, you will use the interactive **Top Hat** to respond to slides presented in lecture, using your personal devices (smart phones, tablets, laptops, etc.). You are <u>required</u> to create a Top Hat account and bring your device to class each day. Instructions are (you guessed it) provided on Canvas.
  - Note: by clicking on the "Gradebook" tab in Top Hat, you can see the questions asked during a previous lecture, and the correct answers. This can be very helpful for studying, and also allows you to assess your "quiz" and "participation" grades (see table below).

## Grades & Grading:

GEOG 2710 is a Constructed World Arch in Ohio BRICKS. It is required of all Geography majors, who need to earn a minimum grade of at least a C-. You cannot receive credit for GEOG 2710 if you have already taken MATH 2500, PSY 2110, both PSY 2111 & 2112, QBA 2010, or ECON 3810.

Percent of Course Grade	Activity	Description	
50	Exams	Three exams (including non-cumulative final) involve computations, as well as multiple choice, T/F, and short answer. Exams are administered in the classroom via Canvas. You may access your notes (handwritten or typed), and any lecture PDFs you previously downloaded. (Access to the PDFs through Canvas will be disabled before the exam.) These are the only materials you may use outside of Canvas.	
20	Homework	Practice problems assigned throughout the semester.	
20	Assignments Additional problem sets handed out over the semester that integ course material, using your chosen dataset (climate data or cens		
10	Participation (Top Hat <sup>*</sup> ) Each class I will record the percentage of Top Hat questions you answered. (Unexcused absences count as a zero.) Your Participation grade will be the average across all the classes.		
Extra Credit	In-class quizzes (Top Hat <sup>*</sup> )	<ul> <li>Designed to reinforce newly-presented material: Each class I will record the percentage of your <u>correctly-answered</u> Top Hat questions.</li> <li>(Unexcused absences count as a zero.) If your average score across all class days before an exam is 70-79%, I will add 1% to your exam score; 80-89% = 1.5%, ≥90% = 2%. The tally begins anew after each exam.</li> </ul>	

\*<u>Note on Top Hat</u>:

Even though a right/wrong answer does not matter for participation credit, take note of how you do on these questions! (View your responses under the Gradebook tab in Top Hat.) If you get questions wrong, it indicates that you don't fully understand the material that was just presented. Use that as your indication to talk to me during office hours, so you can improve your performance on the exams.

In order to receive credit, you must "participate" in these activities, and <u>you must remain for the entire</u> <u>class period</u>. You cannot receive credit without your Top Hat-enabled device. If you present a documented excuse for missing class (e.g., OU-sanctioned activity), you may be marked as excused for the day's Top Hat. Two days will be dropped to allow for malfunctioning or forgotten devices, unexcused absences, etc.

#### Grading scale:

A	A-	B+	В	В-	C+	C	C-	D+	D	D-	F
93-100%	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	≤59

## Academic Dishonesty

It is expected that students will work together to understand the material and to complete some of the tasks. However, activities turned in for credit should reflect the individual student's knowledge, comprehension, and abilities. (Simply copying material from another student is considered plagiarism.) Academic dishonesty includes (but is not limited to) sharing answers on graded assignments, misrepresenting your reason for a missed coursework, presenting another person's work as your own, submitting Top Hat responses or accessing an exam outside of the classroom without permission, or using advantages not approved by the instructor. Any form of academic dishonesty will result in a "0" for that assignment. Cases of academic misconduct may also be reported to the Office of Community Standards and Student Responsibility, which may impose additional sanctions. (Students may appeal any academic sanctions through the grade appeal process.)

#### **Special Circumstances**

If you are unable to participate in the course during the semester for a legitimate reason (e.g., illness, death in your immediate family, religious observance, jury duty, required military reserve training, involvement in University-sponsored activities), notify me ASAP about making up the missed material. (Note: misrepresenting your reasons for missing course activities constitutes academic dishonesty; see paragraph above.) Barring extraordinary circumstances, students should contact me about missed activities before the next class period.

Any student who suspects s/he may need a disability-based accommodation should contact me privately to discuss specific needs, and provide me written documentation from the Office of Student Accessibility Services. If you are not yet registered as a student with a disability, you should contact that office.

Week (beginning)	Торіс:	Readings: (color-coded to topics)		
Week 1	Course introduction; Geographic data	Chapter 1		
(Jan. 13)	Excel basics	Chapters 2, 5		
Week 2	No class Monday – MLK Day			
(Jan. 20)	Descriptive statistics: Central tendency	Chapter 3		
	Descriptive statistics: Dispersion and variability [Homework 1]	Chapter 4		
Week 3	Brobability, the normal distribution and a scores [Homowork 2]	Chapter 0		
(Jan. 27)	Probability, the normal distribution, and z-scores [Homework 2]	Chapter 9		
Week 4	Hypothesis testing and statistical significance	Chapters 8, 10		
(Feb. 3)		Chapters 6, 10		
Week 5	Central Limit Theorem (CLT) and Confidence Intervals (CI)	[no new readings]		
(Feb. 10)		[no new reddings]		
Week 6	Exam 1 Monday Feb 17 (through "CLT and CI")			
(Feb. 17)	One-sample Z-test	Chapter 11		
Week 7	Intro to Assignment 1			
(Feb. 24)	t-test for independent samples [Homework 3a]	Chapter 12		
Week 8	Mann-Whitney II test [Homework 3h]	[no new readinas]		
(Mar. 3)		[no new reddings]		
	Spring Break March 9-15			
Week 9	t-test for dependent samples (matched pairs) [Homework 3c]	Chapter 13		
(Mar. 17)				
Week 10	American Association of Geographers annual meeting in Detroit			
(Mar. 24)	Exam 2 Wednesday Mar 26 (z-, t-, and Mann-Whitney U tests)			
Week 11	Analysis of Variance (ANOVA)	Chapter 14		
(Mar. 31)	Intro to Assignment 2			
Week 12	Correlation [Homework 4]			
(Apr. 7)		Chapters 6, 16		
Week 13	Regression	Chapter 17		
(Apr. 14)	Intro to Assignment 3			
<b>Week 14</b> (Apr. 21)	Chi-square ( $\chi^2$ ) test	Chapter 18		
	Other non-parametric tests (Kruskall-Wallace, Kolmogorov-Smirnov)	Ino new readings		
	Course evaluation			

### **TENTATIVE LECTURE AND READING SCHEDULE (Subject to change)**

# FINAL EXAM: Monday, May 28<sup>th</sup> at 10:10 am

Non-cumulative, covering the material "ANOVA" through the last week