

## GEO505 Syllabus Univariate Statistics in Geography

### Course Details:

Session: Fall 2021  
Classroom: Wilkeson 144  
Lecture times: Mon/Wed 9:10 am – 10:30 am (Eastern Daylight Time)  
Lab times: Fri 10:20 – 11:10 am (Eastern Daylight Time)

Instructor: Xin Tao ([xintao@buffalo.edu](mailto:xintao@buffalo.edu))  
Office: Wilkeson 131  
Office hours: Monday 8:10 – 9:10 am & By appointment

**Course Description:** This course covers the statistical analysis of geographic data and techniques for geographic analysis. No prior statistical knowledge is assumed, and basic statistical concepts are covered. Students will become familiar with basic statistical concepts and methods through lectures and problem solving. The primary purpose of the course is to prepare students for the use of statistical methods in their own academic work and in their future employment. Though the course is aimed at geographical applications, students ultimately entering many other fields should also find the material covered to be useful. The course will also enable students to read a wider range of literature and research reports.

### Course Outline:

Introduction to statistics .....	1 week
Descriptive statistics .....	1 week
Quiz 1 .....	0.3 week
Descriptive statistics .....	1 week
Probability basics .....	0.5 week
Discrete distribution .....	0.5 week
Quiz 2 .....	0.3 week
Binomial distribution.....	0.5 week
Geometric distribution.....	1 week
Poisson distribution.....	0.5 week
Quiz 3 .....	0.3 week
Continuous distribution .....	0.5 week
Exponential distribution.....	1 week
Normal distribution.....	0.5 week
Quiz 4 .....	0.3 week
Confidence interval .....	2 weeks
Quiz 5 .....	0.3 week
Hypothesis testing .....	2 weeks
Quiz 6 .....	0.3 week
Sample size .....	1 week
Spatial sampling .....	1 week
Quiz 7 .....	0.3 week

**Reading:** Statistical Methods for Geography, fourth edition, by Peter A. Rogerson. I encourage you to ask questions in the discussion board or make appointments for office hour.

**Grading:**

There will be 7 quizzes; each is worth 12% of the final grade. Homework problems will be given throughout the term, and will be worth 16% of the final grade. Those students on the borderline between grades will have their grade determined on the basis of effort, class attendance and participation. NO MAKEUPS WILL BE GIVEN WITHOUT A MEDICAL EXCUSE.

Missed quizzes:

1. the student contacts the instructor either before, or on the day of, the scheduled quiz, unless the note that explains the absence indicates why the instructor could not be contacted;
  2. the student provides a note from an appropriate authority, as outlined at: <https://catalog.buffalo.edu/policies/attendance.html>
  3. the student completes the make-up quiz within two weeks of the missed quiz. In the case of the final quiz, they would have to complete it during the scheduled final exam period.
- Late Policy: assignments must be submitted in print or electronic version on the specific due date to the instructor in class. Late work will lose 10 percent per day.

Letter Grade Distribution:

>= 90.00	A	50.00 - 59.99	C
85.00 - 89.99	A-	45.00 - 49.99	C-
80.00 - 84.99	B+	40.00 - 44.99	D+
70.00 - 79.99	B	30.00 - 39.99	D
65.00 - 69.99	B-	<= 29.99	F
60.00 - 64.99	C+		

**Academic Honesty:** Students may, if they wish, work on alternative strategies for solving homework/lab problems together. Students may not copy solutions to solved problems, and each student must hand in his/her own assignments.

**Accessibility Resources:** If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the Office of Accessibility Resources, 25 Capen Hall, 645-2608, and also the instructor of this course. The office will provide you with information and review appropriate arrangements for reasonable accommodations.

**Class Attendance Policy:** <https://catalog.buffalo.edu/policies/attendance.html>: Students are expected to attend classes regularly. A student who incurs an excessive

number of absences may be withdrawn from a class at the discretion of the professor.

**Email:** All correspondence will be via UBLearns and via UB e-mail. Students are responsible for checking UBLearns and their UB e-mail. The professor may not always reply to emails after 6pm or on weekends. Normally, an email would be replied within 24 hours. Emails sent over weekend may not be replied until next workday. E-mails should be respectful and professional.

## Course schedule

The weekly coverage is subject to change as it depends on the progress of the class.

Week	Date	Topics	Assignments
1	8/30 9/1 9/3	Introduction to statistics Diagnostic test Statistics and calculation basics	
2	9/6 9/8 9/10	No Class (holiday) Descriptive statistics: types of data Descriptive statistics: measures of central tendency, dispersion	HWK 1 out
3	9/13 9/15 9/17	Descriptive statistics: shape <b>Quiz 1</b> Descriptive statistics: measures of dispersion	HWK 1 due
4	9/20 9/22 9/24	Descriptive statistics: skewness and kurtosis Descriptive statistics: centers and distances Probability basics	HWK 2 out
5	9/27 9/29 10/1	Discrete distribution <b>Quiz 2</b> Binomial distribution	HWK 2 due
6	10/4 10/6 10/8	Geometric distribution Geometric distribution Poisson distribution	HWK 3 out HWK 3 due
7	10/11 10/13 10/15	<b>Quiz 3</b> Continuous distribution Uniform distribution	HWK 4 out
8	10/18 10/20 10/22	Exponential distribution Exponential distribution Normal distribution	HWK 4 due
9	10/25 10/27 10/29	<b>Quiz 4</b> Normal distribution Confidence interval: one sample	HWK 5 out
10	11/1 11/3 11/5	Confidence interval: one sample Confidence interval: difference between sample means Confidence interval: difference between sample means	HWK 5 due
11	11/8 11/10 11/12	<b>Quiz 5</b> Hypothesis testing: one sample Hypothesis testing: one sample	HWK 6 out
12	11/15 11/17 11/19	Hypothesis testing: two samples Hypothesis testing: two samples <b>Quiz 6</b>	HWK 6 due
13	11/22 11/24 11/26	No Class (Thanksgiving) No Class (Thanksgiving) No Class (Thanksgiving)	
14	11/29 12/1 12/3	Hypothesis testing: type II error Sample size Assumption of independent observations	HWK 7 out
15	12/6 12/8 12/10	Spatial Sampling Review <b>Quiz 7</b>	HWK 7 due