

# Syllabus

## MATH 280-Biostatistics

The mission of Friends University, a Christian University of Quaker heritage, is to equip students to honor God and serve others by integrating their intellectual, spiritual and professional lives.

### Location/time:

<b>Professor</b>	
<b>Text</b>	
<b>Email</b>	
<b>Phone</b>	

**Prerequisite:** BIOL 101 and MATH 270 with grades of C or higher.

**Catalog Course Description:** Credit Hours: 1

This course will supplement the statistics course by examining statistical concepts used specifically in biology, environmental science, health sciences and zoo science. Students will be introduced to the use of computer-based statistical programs to analyze and present biological experimental data.

### Topics

1. Basics.
2. Tests for nominal variables.
3. Descriptive statistics.
4. Tests for one measurement variable.
5. Regression.
6. Multiple tests.

## Outcomes

1. Step-by-step analysis of biological data
2. Types of biological variables
3. Probability
4. Basic concepts of hypothesis testing
5. Confounding variables
6. Exact test of goodness-of-fit
7. Power analysis
8. Chi-square test of goodness-of-fit
9. G-test of goodness-of-fit
10. Chi-square test of independence
11. G-test of independence
12. Fisher's exact test of independence
13. Small numbers in chi-square and G-tests
14. Repeated G-tests of goodness-of-fit
15. Cochran-Mantel-Haenszel test for repeated tests of independence
16. Statistics of central tendency
17. Statistics of dispersion
18. Standard error of the mean
19. Confidence limits
20. Student's t-test for one sample
21. Student's t-test for two samples
22. Independence
23. Normality
24. Homoscedasticity and heteroscedasticity
25. Data transformations
26. One-way anova
27. Kruskal-Wallis test
28. Nested anova
29. Two-way anova
30. Paired t-test
31. Wilcoxon signed-rank test
32. Correlation and linear regression
33. Spearman rank correlation
34. Curvilinear regression
35. Analysis of covariance
36. Multiple regression
37. Simple logistic regression
38. Multiple logistic regression
39. Multiple comparisons
40. Meta-analysis

**Grading:** 90-100% A, 80-89% B, 70-79% C, 60-69% D, < 60% F.

**Other grading considerations:** Late work may not be accepted. Behavior, attendance (for online classes this is measured by consistent online participation throughout each week), and the quality of work are important and will be taken into consideration when final grades are assigned.

**Attendance and absences:** You are responsible for notifying the teacher once for each assignment missed, preferably by email prior to the missed assignment. Prior notification with a reasonable explanation is almost always required for extended deadlines; however, consideration may be given for exceptional circumstances.

**Assignments:** Work is assigned each week. You should reserve at least 1-2 hours of quality time with no distractions for at least 5-6 days per week to work on this course. The Carnegie credit hour unit = 3 hours minimum of student learning time and/or work per week for 16 weeks per credit hour (6 hours per week per credit hour for 8 weeks). For either a 16- or an 8-week course, this equates to 48 minimum hours per credit hour.

*Instructor's note:* You can do it! We can break that down into a doable daily amount: eight weeks \* 6 working days/week = 48 days, resulting in a Carnegie equivalent of one hour per day! This sounds like a lot! It is, but I will do all I can to help you! With my help in carefully helping you learn through structured assignments and helpful examples that I have prepared and chosen for you, you might be able to learn 48 hours' worth of knowledge even more efficiently than normal. I will do my very best to design this course in the very best way so that you can learn as readily as possible for your very best success!!

The most important yet simple secrets for success are to be faithful in working hard every day, and to seek for help when you need it! I will be here for you!

**Assistance:** The [Academic Resource Center](#) (295-5204) is available free of charge for students who desire math help. Click on the link in the previous sentence to view their hours. The ARC is located in the back of the library at the main Wichita campus. In addition to CRLA-certified tutoring which is available any time the tutoring center is open, I will be available daily by email to help you!

**Academic honesty:** (A) A standard of honesty, fairly applied to all students, is essential to a learning environment. Students abridging a standard of honesty must accept the consequences; penalties are assessed by appropriate classroom instructors or other designated people. (B) At the discretion of the instructor, students may be given a grade of zero for suspicious work or assigned similar material and given the lower of the two grades. If evidence of academic dishonesty is discovered, the instructor reserves the right to report

the incident to university officials. (C) If a student is found responsible, "sanctions could include a failing grade for the course, a notation on the transcript, suspension or expulsion from the University, or any combination of these sanctions" (Friends University Catalog). Please read the [Friends University Academic Honor Code Policy](#) which governs your participation in this class.

**Special needs, ADA:** It is the responsibility of the student to bring to the University's attention the need for accommodation due to a qualifying disability. (Friends University Catalog). If you have a physical, perceptual, psychiatric/emotional, medical, or learning disability that may impact your ability to carry out assigned course work, contact Steven Harcus, Director ADA Services. (Email: [steven\\_harcus@friends.edu](mailto:steven_harcus@friends.edu) or Voice 316-295-5522 or 800-794-6945 x5522). We will review your concerns, confirm your disability, and determine, with you, what accommodations are necessary. All information and documentation of your disability is confidential and will not be released by disability services without your written permission.

## **Face Covering Policy, Classroom Guidelines, and Syllabus Statement**

### **Friends University Face Covering Policy**

Friends University faculty, staff, and students are required to wear face coverings in public spaces on campus. Face coverings do not need to be worn when an individual is alone or is eating or drinking, provided social distancing protocols are followed. Faculty, staff, and students are expected to supply their own face coverings. The university will provide face coverings for campus guests, as well as for members of the university community who forget their face coverings.

Please note: If social distancing protocols are observed, the following exceptions to this policy apply:

- Faculty members do not need to wear face coverings while teaching.
- University personnel may designate specific activities in which face coverings need not be worn. For example, university personnel may allow face coverings to be removed during athletic events, fine arts performances, public speaking exercises, and similar activities.

### **Classroom Guidelines for Mitigation of COVID-19 Transmission Risk**

The guidelines below should be followed to minimize the risk of COVID-19 transmission for faculty, staff, and students:

1. Classrooms will be arranged in such a way as to allow a minimum of 6 feet between students.

2. A 6-foot buffer will be maintained between students and faculty at the front of the room.
3. Students are required to wear face coverings in all classes.
4. Students who refuse to wear a face-covering will be asked to leave the class.
5. Faculty members are not required to wear face coverings when teaching, as long as a 6-foot buffer is maintained between faculty and students.
6. Instructors have the ability to allow students to temporarily remove their face coverings if they determine the use of face coverings significantly diminishes the quality or effectiveness of a specific educational activity. Examples of such activities include, but are not limited to, public speaking exercises and student presentations. Social distancing protocols must be followed if an instructor decides to allow students to temporarily remove their face coverings.
7. Group activities will be conducted in such a way as to allow for social distancing.
8. Students should sit in the farthest available seat from the doorway while entering class and those closest to the door should exit class first.
9. Students should not congregate in groups in hallways or other common areas before or after class.
10. Disinfecting wipes will be available at the entrance to each classroom, to allow students to wipe down their desks before the class begins.

### **Syllabus Statement**

**COVID-19 University Precautions:** In order to promote the safety of all members of our community during the COVID-19 pandemic:

- If a student is sick and thinks they have COVID-19, the student needs to stay home until they have gone three days with no fever or other COVID-19 symptoms and ten days since symptoms first appeared.
- If a student tests positive for COVID-19 but does not have symptoms, the student needs to stay home until 10 days have passed since the positive test.

Students who need to miss face-to-face classes should contact their instructors immediately to arrange an SEL or online option in order to continue to participate in class.

**Notice:** This information is subject to additions or changes.