

BIOL 5833: Biostatistics

Fall 2020

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Media: [The Watson Research Lab](#),

[Facebook Classes](#), [Facebook Research](#)

[Twitter Classes](#), [Twitter Research](#)

Time and Place of Class Meetings:

Biostatistics will be held completely online this semester.

Course Description:

Biostatistics introduces students to methods of describing and comparing biological data sets. Students will become familiar with probability and probability distributions, parameter estimation, hypothesis testing, power and sample size determination, and graphical representation. Emphasis will be placed upon basic experimental design, choosing the correct statistical methods, and interpretation of results.

Student Learning Outcomes:

Upon completion of this course, students should be able to:

- Evaluate parametric and non-parametric data using statistical methods
 - Ex: t-test, Chi-Square, ANOVA, ANCOVA, Regression Analysis
- Identify and understand assumptions of different statistical tests
- Evaluate statistics from scientific research and understand results
- Design experiments with proper sample sizes and statistical tests
- Graphically present data
- Properly report statistical data
- Use Common Statistical Packages, with Emphasis on R

Expectations:

Follow along with course materials, take quizzes and exams before the time they are due, and ask questions when you do not understand. We may periodically meet for a Zoom class.

Required Textbooks and Other Course Materials:

I am not requiring a textbook. However, if you can get a copy of *Choosing and Using Statistics, A Biologist's Guide* 3rd Ed. by Calvin Dytham (ISBN-13: 978-1405198394) you will find it useful. Otherwise, all materials will be posted on D2L weekly.

Desire2Learn (D2L):

D2L is an integral part of this course. Weekly video announcements and video lectures will be posted and/or linked to from D2L. Class notes and links to supplemental information will also be available here. **Check D2L regularly!**

Virtual Office Hours:

I will be available via Zoom for five scheduled office hours per week. You may also e-mail me and schedule a meeting at our mutual convenience. My Zoom personal meeting ID is: [728 649 5580](https://us02zoom.us/j/7286495580). I will admit you from the virtual waiting room as soon as I am available.

Grading Policy:

Your grade will be determined by three exams (100 points each), two homework assignments (25 points each), and a final project (150 points). We will have an exam at the end of each major subject and you will present and lead discussion on the experimental design and data analysis of a scientific paper during a zoom class meeting. The final exam/project will be related to the experimental design and statistical evaluation of your thesis project. If you do not have data by the end of the semester, you will work on mock data that can later be replaced by your actual thesis data. **Final Course Grade = (Total points earned) / (500)**

Attendance Policy:

This course will be administered online. When we meet via Zoom I will make sure everyone knows about it well ahead of time.

Diversity, Equity, and Inclusion:

This classroom is a safe place. We are all part of a learning community comprised of diverse backgrounds, skills, ideas, and orientations. People of all diversity dimensions are welcome and valued and I am committed to an inclusive learning environment free from harassment, sexual misconduct, discrimination, or violence. Hate speech will not be tolerated and any form of harassment will result in expulsion from the classroom and a report to the proper university authority.

Conduct Policy:

Be respectful to everyone in the class, including yourself. **Cheating in any form will not be tolerated and may result in you receiving an "F" in the COURSE.** Please refer to the [Student Honor Creed](#).

Classroom Technology:

Students will need a computer with internet access to be successful in this class. Chromebooks and smartphones do not work well with D2L and many of the virtual applications required for this class. Minimum supported software and hardware are outlined [here](#). MSU has negotiated special purchase deals with Dell should a student wish to purchase a new laptop. These purchase options can be found [here](#). Models with greater capability are listed under "Science and Engineering".

Students with Disabilities:

Any student with a disability is encouraged to contact [Disability Support Services](#) (DSS) at 940-397-4140. Special accommodations will be made once the student has been evaluated and provides documentation from that office. However, I will work with you to ensure success regardless of your status with DSS.

Campus Carry:

Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage regarding [Campus Carry](#).

COVID-19:

Please review the [MSU Texas Return to Campus Plan](#)

For this semester, students physically attending classes must comply with MSU's requirement for wearing a face covering as mandated in the [MSU Texas Facial Covering Requirement](#) document.

Cleaning supplies are available upon entry to the classroom. Please sit only in designated seats and maintain as much distance as possible between yourself and other students.

The MSU Safety App provides a link a COVID-19 screening assessment. The MSU Safety App is available on the [Apple Store](#) or [Google Play App Store](#).

IF YOU FEEL ILL IN ANY WAY DO NOT GO TO CLASS!!!

Biostatistics

Lecture Schedule

Class will begin with a formal lecture followed by time to practice problems. We will then have a short break followed by a period of discussion. On exam days, the first half of class will be taken up by the exam followed by a lesson in using statistical packages to perform the analysis from the exam.

Week 1:	02 September	The Scientific Method The Nature of Data
Week 2:	09 September	Descriptive Statistics Variance Assumptions Data Transformation
Week 3:	16 September	Comparing Two Samples Graphing and Reporting Results
Week 4:	23 September	Using Statistical Packages for Two-Sample Tests Exam I Assigned
Week 5:	30 September	Introduction to ANOVA Satisfying Assumptions
Week 6:	07 October	ANOVA and ANCOVA
Week 7:	14 October	Hypothesis Testing Graphing and Reporting Results
Week 8:	21 October	Using Statistical Packages for ANOVA and ANCOVA Exam II Assigned
Week 9:	28 October	Introduction to Regression
Week 10:	04 November	Regression Analysis
Week 11:	11 November	MANOVA and Statistical Modelling Graphing and Reporting Results
Week 12:	18 November	Using Statistical Packages for Regression and MANOVA Project Presentations Exam III Assigned

Note¹: Weekly video announcements will be posted every Monday.

Note²: Students will not return to campus after Thanksgiving

Note³: In the event that we must go 100% online, this course model will experience no interruption in content delivery or assessment.