



Course Syllabus

Experimental Biology and Biostatistics/ Bio 8093

Spring 2018

Instructor: Dr. Rachel Jolley

Course Description:

Experimental design and methods for statistical analysis of biological data, with an emphasis on inquiry using the scientific method.

Course Overview:

The goal of this course is to help students understand how statistics are used as a tool in experimental biology. We will discuss how to design experiments, interpret biological data, and how to formulate hypotheses to be tested. This course will cover the fundamentals of experimental design and summary statistics.

Learning Outcomes:

The goal of this course is to provide students with a fundamental understanding of experimental design and statistics. By the end of the semester, you should be able to: 1) determine how to properly visualize a data set, 2) be able to calculate and interpret basic summary statistics, 3) test hypotheses based on the question being addressed and the distribution of the data, 4) choose the correct statistical test for that hypothesis, and 5) be able to identify potential sources of bias in the experimental design of a study.

Classroom Material:

Textbook: Whitlock, M. C. and Schluter, D. 2014. *The Analysis of Biological Data* (2th Edition). Roberts and Company Publishers. You will be required to read each chapter covered and understand the material.

Supplemental resources: Supplemental lectures covering each chapter are posted in each Unit section.

Contact Information:

I prefer email as the dominate form of communication (rjolley@biology.msstate.edu). I will try to respond within 12 hours, though weekends and holidays may delay the response time. You may also feel free to call/text me if you need to reach me more quickly (662-368-8133).

For all technical questions or problems with Blackboard Learn, please contact the Center for Distance Education Technology by phone (662-325-0278), by live chat during normal business hours (http://www.distance.msstate.edu/distance/technical_assistance), or by email (help@distance.msstate.edu).

Weekly Schedule:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Start of new Unit		Homework assignments due by midnight	One hour help session to review homework assignments	Quiz opens	(Next Unit available through MyCourses)	Quiz closes

We will cover one chapter each week. I will post the material for the next Unit each Saturday, if you would like to work ahead, though the unit will officially begin on Monday of each week.



Homework Assignments:

Each week, you will be assigned a set of homework problems from the book. Please note that there is an answer guide in the back of the book so that you can check your answers. **Be sure to show all of your work and support your answers in each homework assignment. Answers without work/support, or those copied directly from the textbook will not receive credit.** You can complete these in a Word document, Excel document, R print-out, or write it out by hand and scan it in. You will upload these assignments by midnight each Wednesday. We will then review these during the Thursday help session.

Help Sessions:

I will hold a one-hour help session each Thursday evening (exact time to be decided during the first few days of class). These will be held using Blackboard Collaborate. For those of you new to this format, I will hold a brief question/answer session the first week of class (TBD) so that you can log on and become familiar with how to use Blackboard Collaborate. I will review the homework assignment and answer any questions you might have. These sessions will be recorded to be viewed later by those who cannot attend. Those not attending can email me questions in advance. These sessions are optional.

Quizzes:

Each chapter will have a weekly quiz (Friday-Sunday). These will be open-book quizzes, so it is expected that you show all of your work and support your answers. The final exam will also be an open-book exam. Quizzes and the final exam will be timed tests. Once you open it and begin, you will have to complete it in the required time limit. You will not be required to have a proctor or use a proctoring service.

Late Policy:

Assignments will not be accepted late. All assignments must be submitted within the restricted time frame. Quizzes will no longer be available after midnight (or 2 am, depending on your time zone) on Sunday of each week.

Schedule:

Unit	Chapter	dates
Introduction to statistics	1	Jan 8 th -14 th
Visualizing your data	2	Jan 15 th -21 st
Descriptive statistics	3	Jan 22 nd -28 th
Descriptive statistics	4	Jan 29 th -Feb 4 th
Probability	5	Feb 5 th -11 th
Hypothesis testing	6	Feb 12 th -18 th
Analysis: proportions & probabilities	7	Feb 19 th -25 th
Fitting count and frequency data to probability models	8	Feb 26 th -Mar 4 th
Association in categorical data	9	Mar 6 th -12 th
SPRING BREAK	SPRING BREAK	Mar 12 th -18 th
Normal distribution	10	Mar 19 th -25 th
Comparing means-one sample tests	11	Mar 26 th -April 1 st
Comparing means-two sample tests	12	Apr 2 nd -8 th
Violating assumptions	13	Apr 9 th -15 th
Experimental design basics	14	Apr 16 th -22 nd



Synthesis/Review		April 23 rd -26 th
FINAL EXAM	FINAL EXAM	April 27 th -May 2 nd

Grading:

Grade	Points	Total
Homework assignments	10 (x14)	140 (31%)
Quizzes	20 (x13)	260 (58%)
Final Exam	50	50 (11%)
Total		450 (100%)

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

Extra Credit:

There will be no extra credit offered for this course.

MSU Honor Code:

The Mississippi State University Honor Code states: “As a Mississippi State University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do.”

Upon accepting admission to Mississippi State University, students immediately assume a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment to uphold the Honor Code on all quizzes, examinations, papers, and other academic work. Ignorance of the rules does not exclude any student from the requirements of the Honor Code. For additional information please visit: <http://www.honorcode.msstate.edu/>

Academic Honor Code:

I. DEFINITION OF ACADEMIC MISCONDUCT

Cheating, plagiarism, or any other form of academic dishonesty will not be tolerated. Any violation will be dealt with according to the MSU Student Honor Code procedures (<http://www.honorcode.msstate.edu/>). The Honor Code Council Office provides, at the preceding URL, a listing of definitions of acts that constitute academic dishonesty.

However, that is not meant to be an exhaustive list, and other acts may be determined to violate the Honor Code. Note, especially, that many acts of academic dishonesty in the online environment may not be covered in the specific listing of prohibited behaviors.

II. SANCTIONS AGAINST ACADEMIC MISCONDUCT

When it is determined by the Honor Code Council or a faculty member that a student has violated the MSU Honor Code, *the normal sanction assigned for a first offense will be an “XF” for the course, probation, and a requirement to complete the Academic Integrity Intervention Program.* The Honor Code Council or faculty member will only impose a lesser grade sanction (a lowered course grade rather than an F) in exceptional circumstances, such as a case where the assignment involved is a minor part of the final course grade. The dishonesty notation (“X”), probation and the intervention program will be required with all grade sanctions. If a



faculty member wishes to impose a more severe penalty than an XF, then the case must be referred to the Honor Code Council. The Honor Code Council has the authority to remove a student from the University, even for first offenses. Decisions by the Honor Code Council Hearing Panels are binding on all parties.

Title IX:

MSU is committed to complying with Title IX, a federal law that prohibits discrimination, including violence and harassment, based on sex. This means that MSU's educational programs and activities must be free from sex discrimination, sexual harassment, and other forms of sexual misconduct. If you or someone you know has experienced sex discrimination, sexual violence and/or harassment by any member of the University community, you are encouraged to report the conduct to MSU's Director of Title IX/EEO Programs at 325-8124 or by e-mail to titleix@msstate.edu. Additional resources are available at <http://www.msstate.edu/web/security/title9-12.pdf>, or at <http://students.msstate.edu/sexualmisconduct/>.

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