

Florida State University
Department of Statistics
STA 2171: Statistics for Biology



Fall 2021, Section 4

Instructor: James O'Hagan	Class Grader: Yijia Ma
Email: jro18b@my.fsu.edu	Time: MoWe 4:50PM - 6:05PM and Fr 9:20AM - 10:10AM
Place: HCB 214 and HCB 315 (Fr)	

Virtual Office Hours: On Zoom, by appointment. Please email me to set up a meeting. 1-2PM EST Tuesdays and Thursdays.

Course Information:

- **Delivery Format:** This class will be taught in person and live on Zoom- which you can access through Canvas (canvas.fsu.edu) from Aug 23rd to Dec 10th.
- **Prerequisites:** MAC 2311 Calculus I and Biology major status, or departmental approval.
- **Credit Hours:** 4
- **Previous Credit:** No credit is given for STA 2171 if a C- or better has been previously earned in STA 3032 or QMB 3200.

Main References: While we will primarily use course notes that will be available on canvas and during class the following materials are also recommended.

- **Software:** Excel or R (we will rarely use these).
- **Textbook:** *Practice of Statistics in the Life Sciences*, 4th Edition, Author: Baldi, Moore, Publisher: Pearson (the third edition would also suffice and can usually be found used for under 20\$).
- **Calculator:** TI-84 or equivalent. Phones are prohibited during exams.
- **Course Website:** <https://canvas.fsu.edu/courses/51686>

Course Description: This course provides an introduction to statistics emphasizing applications in Biology. Topics include descriptive statistics, elementary probability, the binomial and normal distributions, confidence intervals and hypothesis tests for means and proportions, correlation and regression, contingency tables and goodness-of-fit tests, analysis of variance and non-parametric tests. The purpose of this course is to prepare students for further study and job preparation in the Biological Sciences including the fields of Medicine, Dentistry, Veterinary Medicine, Zoology, Botany, and other healthcare professions. It will emphasize the understanding of data and interpretation of statistical analyses. It will require students to think of data, and report the results of their analyses, in context.

Course Objectives:

By the end of the course, a successful student should be able to:

1. Analyze and address problems drawn from real world scenarios by applying appropriate mathematical, statistical, logical, and/or computational models or principles.
2. Interpret and evaluate data and information as presented in a variety of modes (such as tables, graphs, and charts), using appropriate technology. They will also be able to clearly communicate a summary of their findings to peers. The above two competencies will be assessed in the Liberal Studies Quantitative Assessment for STA 2171, which includes a written summary of results.
3. Use descriptive statistics and graphical methods to summarize data accurately.
4. Use inferential statistics to make valid judgments based on the data available.
5. Select the appropriate statistical tools to analyze a particular problem.
6. Describe the goals of various statistical methodologies conceptually.
7. Develop a healthy skepticism toward statistical studies and their results based on a sensible consideration of the techniques employed.

Grading Policy: The grading breakdown is as follows; tests (60%), LSQA (15%), Open Quizzes (10%) and Homework 15%. The lowest test grade will be dropped (note this does not include the LSQA). While I reserve the right to adjust final grade cutoffs downwards based on the performance of the class you are guaranteed the following letter grades if your raw final score is; 92.5 A, 89.5 A-, 86.5 B+, 82.5 B, 79.5 B-, 76.5 C+, 72.5 C, 69.5 C-, 60 D-. These are strict cutoffs (i.e. if you receive an 82.45 you will still receive a B-). All assessments will be online and will not use honorlock.

Assessments that are not submitted will receive a grade of zero. When a makeup is submitted, the zero will be replaced with the earned grade.

Important Dates:

Classes begin	Aug. 23, 2021
Last day to drop add without fees	Aug. 26, 2021
Labor day no class	Sept. 6, 2021
Test 1	Sept. 9, 2021
Test 2	Sept. 30, 2021
Drop Deadline (no grade)	Oct. 8, 2021
Homecoming (no class)	Oct. 22, 2021
LSQA	Oct. 23, 2021
Veterans Day (no class)	Nov. 11, 2021
Drop Deadline with Dean's Permission	Nov. 12, 2021
Test 3	Nov. 13, 2021
Thanksgiving Holiday	Nov 24-26th.
Test 4	Dec. 2, 2021
Final Exam Week	December 6th-10th

How to complete this class successfully For each topic:

1. Come to class either on Zoom or in Person.
2. If you are able to, take notes as you attend class (there have been studies done that indicate that the act of taking notes helps students retain information).

3. Study thoroughly the information and examples in the filled-in class notes – be aware that the notes are incomplete without the filled-in examples.
4. Attempt the relevant Open Quiz as it occurs.
5. Do all of the try-on-your-own exercises in the notes.
6. Do all of the extra/investigative exercises posted with the notes.
7. Study the solutions even if you get the answers right because the solutions can provide insights to the problems,
8. Make sure you know how to use your calculator appropriately.
9. Go back and finish up the relevant Open Quiz, then take the relevant Timed Quiz. Remember that you can email me or come to virtual office hours if you need help.

University Attendance Policy: Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

I do not formally check attendance.

ATTENDANCE, ABSENCE AND DROP/WITHDRAWAL

1. University drop and withdrawal deadlines are available at <https://registrar.fsu.edu/calendar/>.
2. First-day attendance will be taken electronically on the course website.
3. You are expected to adhere to all assessment deadlines.
4. Lack of future planning, or mismanagement of time and other resources, are not acceptable reasons for missing assessment deadlines.
5. Bear in mind that the opportunities presented in this class are made equally available to all students in the class and it is up to each individual to make the most of these opportunities.
6. In the interests of fairness, we will not do for one student what we cannot do for all students who are likely to request the same.
7. Documentation for missing assessment deadlines will not be accepted after the Last Day of Class.

Activity and Homework Grading Policy: We will allow absolutely no make-ups, no extra credit assignments, and in general, no opportunities for grade improvement, after the Last Day of Class, so please do your best during the term. Assessments that are not submitted will receive a grade of zero. When a makeup is submitted, the zero will be replaced with the earned grade. All assessments will be open-notes.

Academic Honor Policy: The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University." (Florida

State University Academic Honor Policy, found at <http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy>)

Americans with Disabilities Act: Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Office of Accessibility Services; and (2) request a letter from the Office of Accessibility Services to be sent to the instructor indicating the need for accommodation and what type; and (3) meet (in person, via phone, email, skype, zoom, etc. . .) with each instructor to whom a letter of accommodation was sent to review approved accommodations. This syllabus and other class materials are available in alternative format upon request. For the latest version of this statement and more information about services available to FSU students with disabilities, contact the:

Office of Accessibility Services

874 Traditions Way

108 Student Services Building

Florida State University

Tallahassee, FL 32306-4167

(850) 644-9566 (voice)

(850) 644-8504 (TDD)

oas@fsu.edu

<https://dsst.fsu.edu/oas/>

Free Tutoring from FSU: On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity. Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

Test/LSQA Makeup Policies: In the instance that you miss a test or the LSQA you will be allowed to make up the assessment so long as you submit documentation within one week after the exam date. Appropriate excuses include all cases covered by the university attendance policy. Note that this does not apply to the final exam. There is a test makeup date in the final week of classes reserved for this purpose. The lowest test score is also dropped.

Regrading Policy: In the event that you feel like your test or homework was graded unfairly you will have up to one week to request a regrade after the homework, quiz, or test has been graded. This cutoff is strict.

Note on Technology-dependent Assessments This course is heavily technology-dependent. While I will do my best to work with you on technology issues, please be aware that if you take an assessment but we can find absolutely no record of the fact, then I will not be able to give you credit for it. Please DO NOT USE SAFARI when you take assessments on Canvas – please use Chrome or Firefox. Please make sure your browser is in full screen mode. In the past students have run into formatting issues when their browsers were not in full screen mode.

Syllabus Policy Changes: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Sexual Misconduct Policy: As an instructor, I am obliged to report all instances of sexual misconduct that

I become aware of; I cannot hold such information confidential. If you would like to discuss your situation in confidence, you may contact the Victim Advocate Program (<https://dos.fsu.edu/vap/>), the University Counseling Center (<https://counseling.fsu.edu/>), the Employee Assistance Program (<https://eap.fsu.edu/>), or University Health Services (<https://uhs.fsu.edu/>). Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Counseling and Psychological Services Askew Student Life Center, 2nd floor
942 Learning Way

(850) 644-8255

<https://counseling.fsu.edu/>

University Health Services Health and Wellness Center

(850) 644-6230

<https://uhs.fsu.edu/>

Final Exam There will be no final exam this semester.

Liberal Studies Quantitative and Logical Thinking Requirements: This course has been approved to meet FSU's Liberal Studies Quantitative and Logical Thinking requirements and is designed to help you become a critical analyst of quantitative and logical claims.

In order to fulfill the State of Florida's College mathematics and computation requirement the student must earn a "C-" or better in the course.

By the end of the course, students will demonstrate the ability to:

(1) Select and apply appropriate methods (i.e., mathematical, statistical, logical, and/or computational models or principles) to solve real-world problems.

(2) Use a variety of forms to represent problems and their solutions.

The above two competencies will be assessed in the Liberal Studies Quantitative Assessment for STA 2171 , which includes a written summary of results.

Public Health Protocols

In our classroom, I will expect everyone to wear a proper, well-fitting mask. As our President has informed the university community, FSU expects everyone on campus to use face-coverings. In regions where virus rates are high, the CDC recommends that even vaccinated individuals wear masks in public indoor spaces, like classrooms, especially where social distancing is not possible. Florida infection and hospitalization rates are greater now than they were at the height of the 2020 surge due to the Delta variant, a more infectious and easily transmissible version of the COVID-19 virus. The best way to protect against serious illness is to be fully vaccinated, but not everyone among us can be. Because the Delta variant can infect even vaccinated individuals and can be spread by them to others, it poses a special threat to members of the community with underlying health conditions and children at home who are too young for vaccination.

For these reasons, FSU expects each member of the community to comply with the public health protocols our President set forth on August 9, 2021, including (1) wearing masks in public indoor spaces, (2) getting fully vaccinated, (3) being tested for the virus if you have symptoms, and (4) staying home and away from others if you are sick. Please remember that you should NOT attend class in person if you have tested positive for COVID-19 or are quarantining after exposure. Finally, please bear in mind that the COVID-19 situation is fast-moving, and that university guidance on the issue may change at any time.

Correspondence: I will do my best to answer emails as soon as I can. However at times it might be 48 hours before I can get back to you. Therefore, if you have a pressing issue please try and contact me with enough lead time to respond to your query.

- Please turn on the course notifications on Canvas by going to Account / Notifications / and checking the Notify me right away option for all of the items under Course Activities.

- I will communicate with you by sending emails to your @my.fsu.edu account and posting announcements on the course website. Please check your FSU email and the Canvas announcements every day.
- If you email me please send your email from your @my.fsu.edu account.
- Please send assessment-related enquiries least 24 hours before the assessment is due.
- You may expect a response to your email within two work days. But if you email me with an enquiry that was previously addressed in the syllabus, in a class email or in a course announcement, you may not get a response.

HB233 Recording

In this class, consistent with state law and university policy, students are permitted to make recordings of class lectures for personal use only. As noted, sharing, posting, or publishing classroom recordings may subject you to honor code violations and legal penalties associated with theft of intellectual property and violations of other state law. Moreover, students and educators have expressed concern that recording classroom activities may negatively impact the learning experience for others, especially in classes that involve questions, discussion, or participation. To protect a learning environment in which everyone feels free to experiment with ideas, we ask you refrain from recording in ways that could make others feel reluctant to ask questions, explore new ideas, or otherwise participate in class. Students must monitor their recording so that they do not include participation by other students without permission. Students with disabilities will continue to have appropriate accommodations for recordings as established by the Office of Accessibility Services.

Week	Monday	Wednesday	Friday
1 Aug. 23	Class Intro	Plots/Charts	Summary Stats
2 Aug. 30	Summary Stats	Empirical Rule	Basic Prob
3 Sept. 6	Labor Day no class	Test 1	Basic Prob
4 Sept. 13	Binomial Distro	Normal Distro	Normal Distro (HW 1 due)
5 Sept. 20	CLT	CLT	CLT
6 Sept. 27	Test 2	Confidence Intervals	One Sample/Paired Samples
7 Oct. 4	Two Sample Tests	Two Sample Tests	Two Sample Tests
8 Oct. 11	Nonparametric Tests	Nonparametric Tests	No class
9 Oct. 18	Nonparametric Tests (HW2)	LSQA	ANOVA
10 Oct. 25	ANOVA	ANOVA	ANOVA
11 Nov. 1	ANOVA	ANOVA	ANOVA (HW 3)
12 Nov. 8	No Class Veterans Day	Test 3	Correlation/SLR
13 Nov. 15	SLR	SLR Inference	SLR Inference
14 Nov. 22	MLR Inference (HW 4)	No Class	No Class
15 Nov. 29	MLR Inference	Review/Special Topics	Review/Special Topics
16 Dec. 6	Test 4		