

STA 2171: Statistics for Biology

Section 0002

Department of Statistics
Florida State University
Fall 2022

Course Information

Class Times and Location

This class will be taught **Face-to-Face (F2F)** (i.e., **in-person**) at the times and locations listed below.

- Tuesday & Thursday, 11:35 AM - 12:50 PM, HCB 0207
- Friday, 12:00 - 12:50 PM, HCB 0212

Instructor

- Name: Adam Dixon
- Email: ad18g@fsu.edu
- Office: OSB 209B
- Office Hours: Wednesday 1:00 - 2:00 PM (in-person), or by appointment (in-person/Zoom)

Grader

- Name: Benjamin Beaudett
- Email: beb20bx@fsu.edu

Course Website: Canvas (<https://canvas.fsu.edu>)

Course Description

Prerequisites

MAC 2311 Calculus I and Biology major status, or departmental approval.

Credit Hours: 4

Special Note

No credit is given for STA 2171 if a “C–” or better has been previously earned in STA 3032 or

QMB 3200.

Required Materials

- A personal computer with a reliable Internet connection and Google Chrome or Mozilla Firefox
- TI-84 Plus (or equivalent) calculator. I will teach you how to use a TI-84 series calculator, but I cannot promise to be able to help with any other type of calculator. If you are unsure if a calculator you already have is “equivalent” to a TI-84 series calculator, please discuss it with me.

Note: A textbook is **not required** for this course. I will provide all required course notes and exercises. Please note that the materials provided were put together for your individual use only. While you may share these materials with classmates, I ask that you do not share them with third parties who are not enrolled in this class. If you seek help outside of class, you may, of course, allow your helper to see the materials, but please do not allow them to make copies or in any other way take this material. I appreciate your co-operation in protecting this material. Thank you!

Recommended Materials

Illowsky, B., & Dean, S. (2013). *Introductory Statistics*. OpenStax. <https://openstax.org/books/introductory-statistics/pages/1-introduction>

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 field of Biological Sciences including Medicine, Dentistry, other healthcare professions, Veterinary Medicine, Zoology and Botany. It will emphasize 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.

Learning Objectives

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:

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.

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.

Assessments and Grading

Assessments		
Type	Count	Total Weight
Attendance	—	20%
Quizzes	5	45%/25%*
LSQA	1	10%
Final Exam	1	25%/45%*
Subtotal:		100%
Extra Credit		
Office Hours	—	5%
Total:		105%

* - If your *Quiz Grade* is **greater** than your *Final Exam Grade*, then your *Quiz Grade* will receive a 45% weight and your *Final Exam Grade* will receive a 25% weight. On the other hand, if your *Quiz Grade* is **less** than your *Final Exam Grade*, then your *Quiz Grade* will receive a 25% weight and your *Final Exam Grade* will receive a 45% weight.

1. Attendance will be recorded in-class at least once a week. These attendance checks are not graded for any sort of accuracy; rather, you will be marked either present (1) or absent (0). You are permitted to miss five (5) attendance checks; excused absences do not count toward this limit and will be counted as present. **In general, attendance checks will not be announced ahead of time, so you should assume attendance will be recorded each class period, even though this may not occur.**

Your Attendance Grade will be computed as

$$\text{Attendance Grade} = \min \left(\frac{\text{Total Presents}}{\text{Total Attendance Checks} - 5}, 1 \right)$$

reported as a percentage rounded to two decimal places. The highest value this grade can take is 100.00%.

2. There will be five (5) timed Quizzes, each of which will cover approximately two weeks' worth of material. These single-submission assessments, graded for accuracy, will be administered on paper during the class period listed on the Tentative Pacing Schedule (TPS). Group work is not permitted.

Your **Quiz Grade** will be the simple average of your five Quizzes, each reported as a percentage rounded to two decimal places.

3. There will be one (1) timed Liberal Studies Quantitative Assessment (LSQA), a university-mandated assessment covering one topic, given online through Canvas. This online assessment, graded for accuracy, cannot be dropped. You may neither collaborate with other students nor

use any Internet resources except the material provided on our Canvas course site, but you will be allowed two (2) attempts.

Each attempt will be graded, and your **LSQA Grade** will be the higher of the two attempts, reported as a percentage rounded to two decimal places.

- There will be one (1) timed, cumulative Final Exam. This single-submission assessment, graded for accuracy, will be administered on paper during the Final Exam window listed both below and on the TPS.

Your **Final Exam Grade** will be reported as percentage rounded to two decimal places.

- Extra credit will be awarded for attending office hours (posted or via an appointment) throughout the semester. At the end of the semester, your **Extra Credit Award** will be assigned according to Table 1.

Table 1: Extra Credit for Attending Office Hours

Office Hour Visits	Award
0	0%
1	1%
2	2%
3	3%
4	4%
5+	5%

The Final Exam will be offered on Monday, December 5, 2022 at 10:00 AM - 12:00 PM in HCB 0207. Further instructions will be given as Finals Week approaches. Please see the TPS for all other assessment dates.

Final instructions will be given prior to each assessment, but the following will generally apply (unless told otherwise):

- You will be allowed one doubled-sided (or, equivalently, two one-sided) notesheet(s) (handwritten or typed) upon which you can include any information you wish.
- You will be allowed to use your calculator.

Unless told otherwise, under no circumstances will you be allowed during an assessment to:

- Share resources, equipment, work, or answers with other students.
- Receive help from other students or people.
- Give help to other students.

If you miss an assessment, there may be make-up opportunities (see the Make-Up Policy). **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.**

Table 2: Grade Distribution

Letter Grade	Numerical Grade
A	93 – 105
A-	90 – 92
B+	87 – 89
B	83 – 86
B-	80 – 82
C+	77 – 79
C	73 – 76
C-	70 – 72
D+	67 – 69
D	63 – 66
D-	60 – 62
F	0 – 59

Your overall course grade will be calculated according to the following.

$$\begin{aligned}
 \text{Overall Course Grade} &= 0.20 \cdot (\text{Attendance Grade}) \\
 &+ 0.10 \cdot (\text{LSQA Grade}) \\
 &+ 0.45 \cdot \max(\text{Quiz Grade}, \text{Final Exam Grade}) \\
 &+ 0.25 \cdot \min(\text{Quiz Grade}, \text{Final Exam Grade}) \\
 &+ \text{Extra Credit Award}
 \end{aligned}$$

Your final letter grade will be assigned using Table 2 and the smallest whole number greater than or equal to your Overall Course Grade (e.g., an Overall Course Grade of 89.04 will be assigned an A- since 90 is the smallest whole number greater than or equal to 89.04).

Grades will not be curved, and there will be no opportunities for extra credit, make-ups, or any other form of grade improvement after the Last Day of Classes (December 2, 2022). Therefore, you should do your best throughout the entire semester.

Note on Technology-dependent Assessments

This course is 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 I 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; use Chrome or Firefox instead.

We will not be using Honorlock for online assessments.

Course Policies

Syllabus Change Policy

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.

Cancellations Due to Lack of Attendance

Please note that, for each class period, if no students show up within the first 15 minutes, or if there is a 15-minute stretch of time when no students show up after the last student has left, then the rest of the period will be cancelled. The next lecture will begin where the cancelled lecture would have left off, and the next assessment will include the material that would have been taught in the cancelled lecture.

Recorded Lectures Policy

Please note that the recorded lectures and/or other recordings are the property of Florida State University and are being made available only to the students enrolled in this class. Students are not permitted to share the recorded lectures or other recordings with any person or entity outside of this class. Copyrights of the recorded lectures and other recordings are reserved by the instructor and Florida State University.

Email & Communication Policy

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

If you email me, please do so from your **fsu.edu** account. While you can expect me to try to answer as quickly as possible, please allow me up to two working days to respond. If I have not responded by that time, I encourage you to send me a follow-up email.

You are also welcome to message me through Canvas, but my quickest responses will always come through email.

Please be sure to check our course's Canvas site and your **fsu.edu** email account daily.

Behavior Policy

During lectures,

1. Please do not have conversations with your peers unless I have asked for a group discussion.
2. Please silence your devices. If you are expecting an important phone call, then please sit near the door so you can step out without causing a distraction.
3. Please minimize device usage. I understand that inside the classroom you may want to take notes using your devices, and outside of the classroom you have a life which may require you to be accessible. Therefore, I do not mind your using your devices during class. But if I notice your device usage is excessive, distracting, or disproportionately irrelevant to the lecture, then I will ask you to put your devices away.
4. Please treat your peers with respect.
5. Please ask questions if you have them.

Grade Appeal Policy

If you believe an assessment has been improperly graded, then you must discuss it with me within one (1) calendar week after your graded assessment has been returned to you (for paper assessments) or your grade has been posted to Canvas (for online assessments). If I do not hear from you within this period, the grade will remain unchanged.

Make-Up Policy

Make-ups are for missing an in-person assessment or being unable to begin and complete an online assessment during its availability. Make-ups will not be given due to undesired performance on an assessment, **nor will they be given once you begin an online assessment.**

If you miss an in-person assessment or are unable to begin and complete an online assessment during its availability, then please email me immediately. Unless told otherwise, you will have until Friday of the following week to make up the missed assessment unless you have a documented reason for being unable to do so. You will be allowed two (2) free make-ups (i.e., you can use them for any reason), but you must provide documentation for all further make-up opportunities, unless told otherwise. If you do not complete a make-up according to the above guidelines, then the missed assessment will receive a grade of zero (0).

No make-ups will be given after the Last Day of Classes. If you miss the Final Exam, then you must email me immediately.

Note: Since some assessments will be given online, you may experience technical issues during testing that prevent you from making a complete submission. If this happens, please email me as soon as possible, and we will figure something out.

Classes Subject to 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.

Public Health Protocols

Students will need to follow the University's current health and safety guidelines when they attend class.

Disaster Policy

At times of severe weather or other disasters, please check your FSU email, your text messages, the Seminole Safe App and FSU Alerts (<https://alerts.fsu.edu/>) as often as you can to keep yourself informed. Check them every day before you leave home so that you don't miss any last minute announcements.

If the University closes due to a disaster, we will all be informed via the above means, and classes and office hours will be automatically canceled even if I do not announce it. As long as the University remains open, classes will still be on.

However, please practice safety first. If it will be unsafe for you to come to class due to the effects of a disaster, please do not attempt to come in. You will not be penalized; I will work with you.

Final Exam Rescheduling Policy

You may not take the final exam before final exams week. Individual students who need to reschedule the final exam for a different time during final exams week should talk to me about it first to get my approval and then fill out and follow the instructions on the "Request to Reschedule a Final Examination" form at

https://artsandsciences.fsu.edu/sites/g/files/upcbnu321/files/2022-01/Request_to_Reschedule_01032022.pdf

The form needs to be submitted to the College of Arts and Sciences before 5:00 PM on the Last Day of Classes.

If you experience a documented emergency that prevents you from observing the above deadline, contact me as soon as you are able to, and we will take it from there.

Incomplete Grades

A request for a grade of "Incomplete" will

- **not be granted** if you have completed the coursework, including the assessments that cannot be dropped and excluding the drops and allowable absences.
- **be granted** only if **both** of the following conditions are satisfied:
 1. the only assessment that you have yet to take is the final assessment, and
 2. your overall average excluding the final assessment is a passing grade (70% or above).

Sexual Misconduct and Title IX Reporting

As an instructor, I am obliged to report all instances of sexual misconduct that I become aware of to the University's Title IX Director; 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/>), Counseling and Psychological Services (<https://counseling.fsu.edu/>), the Employee Assistance Program (<https://eap.fsu.edu/>), University Health Services (<https://uhs.fsu.edu/>), or pastoral counselors.

If you would like to submit a report to the University's Title IX Director, please go to <https://report.fsu.edu/>.

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.

Drop and Withdrawal deadlines are given in the University's academic calendar at <https://registrar.fsu.edu/calendar/>

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/Academics/Academic-Honor-Policy>)

Academic Success

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.

Americans with Disabilities Act

Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

Students with disabilities needing academic accommodations 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.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided.

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>

Academic accommodations will be provided as soon as possible after verification is received. Academic accommodations are not retroactive, so they will not apply to lectures/lessons and assessments that took place before verification was received.

Confidential Campus Resources

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Victim Advocate Program
University Center A, Rm. 4100
(850) 644-7161
Available 24/7/365
Office Hours: M-F 8-5
<https://dsst.fsu.edu/vap>

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/>

Other Contact Info

- FSU Police
 - **Phone (Non-emergency):** (850) 644-1234
 - **Phone (Emergency):** 911
 - **Website:** <https://police.fsu.edu>
- Canvas Support
 - **Email:** canvas@fsu.edu
 - **Phone:** (850) 644-8004
 - **Website:** <https://support.canvas.fsu.edu/home/>
- Department of Statistics
 - **Main Office:** OSB 214
 - **Phone:** (850) 644-3218
 - **Website:** <https://stat.fsu.edu>

Tentative Pacing Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Aug 22nd	23rd 1 First-Day Attendance	24th	25th 2 Summary Statistics	26th 3 Summary Statistics
29th	30th 4 Summary Statistics	31st	Sep 1st 5 Summary Statistics	2nd 6 Summary Statistics
5th LABOR DAY (No Class)	6th 7 Probability	7th	8th 8 Probability	9th 9 Quiz 1
12th	13th 10 Prob. / Binom. Distr.	14th	15th 11 Binomial Distribution	16th 12 Binomial Distribution
19th	20th 13 Normal Distribution	21st	22nd 14 Normal Distribution	23rd 15 Quiz 2
26th	27th 16 Norm. Distr. / CLT	28th	29th 17 Central Limit Theorem	30th 18 Central Limit Theorem
Oct 3rd	4th 19 Inference for Pop. Means	5th	6th 20 Inference for Pop. Means	7th 21 LAST DAY TO DROP Quiz 3
10th	11th 22 IFPM / IFPP	12th	13th 23 Inference for Pop. Props.	14th 24 Inference for Pop. Props.
17th	18th 25 One-Way ANOVA	19th	20th 26 One-Way ANOVA	21st 27 LSQA
24th	25th 28 One-/Two-Way ANOVA	26th	27th 29 Two-Way ANOVA	28th 30 Two-Way ANOVA
31st	Nov 1st 31 Simple Linear Regression	2nd	3rd 32 Simple Linear Regression	4th 33 Quiz 4
7th	8th 34 SLR / MLR	9th	10th 35 Multiple Linear Regression	11th VETERANS DAY (No Class)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
14th	15th 36 MLR / Nonparam. Stats	16th	17th 37 Nonparam. Statistics	18th 38 Quiz 5
21st	22nd 39 Nonparam. Stats / Misc. Topics	23rd THANKSGIVING (No Class)	24th THANKSGIVING (No Class)	25th THANKSGIVING (No Class)
28th	29th 40 Misc. Topics / Review	30th	Dec 1st 41 Misc. Topics / Review	2nd 42 LAST DAY OF CLASSES Misc. Topics / Review
5th FINALS WEEK Final Exam 10:00 AM - 12:00 PM	6th FINALS WEEK	7th FINALS WEEK	8th FINALS WEEK	9th FINALS WEEK