

STA 2171: Statistics for Biology

Section 0002

Department of Statistics
Florida State University
Fall 2020

Course Information

Class Times and Location

This class will be taught remotely and asynchronously. As such, there are no scheduled class times nor any assigned meeting places. All content will be hosted on the course's Canvas site.

Instructor

- Name: Adam Dixon
- Email: ad18g@my.fsu.edu
- Office Hours (Zoom): Tuesday & Wednesday, 3:00 - 4:00 PM, or by appointment

Note: I will be unable to meet with you face-to-face, but I will be available through Zoom and email. Links to join my scheduled Zoom office hours are available on Canvas.

Grader

- Name: Ding Jiang
- Email: dj16c@my.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 Chrome or Firefox
- TI-84 (or equivalent) calculator

Recommended Materials

Baldi, B. & Moore D. S. (2018). *The Practice of Statistics in the Life Sciences* (Fourth ed.). New York, NY: W. H. Freeman and Company.

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.

Course 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 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.

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	5	10%
Quizzes	5	30%/50%*
LSQA	1	10%
Final Exam	1	30%/50%*
Subtotal:		100%
Extra Credit		
Bonus Questions	—	5%
Total:		105%

* - If your overall Quiz grade is **greater** than your Final Exam grade, then your overall Quiz grade will receive a 50% weight and your Final Exam grade will receive a 30% weight. On the other hand, if your overall Quiz grade is **less** than your Final Exam grade, then your overall Quiz grade will receive a 30% weight and your Final Exam grade will receive a 50% weight.

1. Watching the lecture videos is equivalent to attending class and listening to lectures. I acknowledge that the lecture videos are not short, but remember that class time would have been 50 or 75 minutes – not short either. On the bright side, however, you may pause the video at any time and return to it later – you would not have been able to do that with live lectures. Therefore, I fully expect you to watch the lecture videos in their entirety. Pause whenever you need to, but always be sure to return and finish watching the video.

To that end, there will be five (5) Attendance quizzes given through Canvas throughout the semester. These quizzes are meant to be small checks to make sure you are watching lectures, and you will be given three (3) attempts and unlimited time for each quiz.

Your overall Attendance grade will be the simple average of your attendance quiz scores (each reported as a percentage rounded to two decimal places).

2. There will be five (5) Quizzes, each of which will cover approximately two weeks' worth of material, given through Canvas.

Your overall Quiz grade will be the simple average of your four (4) highest-scoring Quizzes (each reported as a percentage rounded to two decimal places). That is, **your lowest Quiz grade will be dropped.**

3. There will be one (1) Liberal Studies Quantitative Assessment (LSQA), a university-mandated assessment covering one topic, given through Canvas.

Your LSQA grade will be reported as a percentage rounded to two decimal places.

4. There will be one (1) cumulative Final Exam given through Canvas.

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

The Final Exam will be given during Finals Week (December 7, 2020 - December 11, 2020). Further instructions will be given as Finals Week approaches. Please see the Tentative Pacing Schedule (TPS) for all other assessment dates.

Final instructions will be given prior to each assessment, but the following will generally apply:

- Each assessment will be **open book**, which means you can use your own notes, any material (e.g., notes, slides, emails, videos) I provide, or any other resources at your disposal (excluding other humans unless told otherwise).
- You will be allowed to use your calculator.

Unless told otherwise (there will be opportunities for collaboration), 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 are unable to complete an assessment during its availability, 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.**

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.

$$\begin{aligned}\text{Overall Course Grade} &= 0.10 \cdot (\text{Attendance Grade}) \\ &\quad + 0.10 \cdot (\text{LSQA Grade}) \\ &\quad + 0.50 \cdot \max(\text{Quiz Grade}, \text{Final Exam Grade}) \\ &\quad + 0.30 \cdot \min(\text{Quiz Grade}, \text{Final Exam Grade})\end{aligned}$$

Your final letter grade will be assigned using the table above 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 Class (December 4, 2020). Therefore, you should do your best throughout the entire semester.

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 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 – please use Chrome or Firefox.

We will not be using Honorlock.

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.

Recorded Lectures Policy

Recorded lectures are FSU properties and only available to students enrolled in this class. Students are not allowed to share the recorded lectures to any other people not enrolled in this class. Copyright of the recorded lectures are reserved by the instructors and FSU.

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 **my.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.

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 grade has been posted to Canvas. If I do not hear from you within this period, the grade will remain unchanged.

Grade appeals will not be allowed after the Last Day of Class.

Make-Up Policy

Make-ups are for being unable to submit an assessment during its availability. Make-ups will not be given due to undesired performance on an assessment.

If you are unable to submit an assessment during its availability, then please email me immediately. 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 three (3) make-ups without providing documentation, but you must provide documentation for all further make-up opportunities. 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 Class. If you are unable to submit the Final Exam during its availability, then you must email me immediately.

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 will need to

- (i) talk to me about it first and get my permission to reschedule,
- (ii) fill out the "Request to Reschedule Final Examination" form at

<https://artsandsciences.fsu.edu/students/undergraduate/forms-requiring-deans-approval/rescheduling-final-examination>

and get it approved by the Dean of Arts and Sciences office, and

(iii) let me have the approved form **by 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'll take it from there.

Sexual Misconduct and Title IX Reporting

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/>), or pastoral counselors.

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.

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>)

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/>

Tentative Pacing Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Aug 24th 1 First-Day Attendance Due	25th 2 Summary Statistics	26th 3 Summary Statistics	27th 4 Summary Statistics	28th 5 Summary Statistics
31st 6 Summary Statistics	Sep 1st 7 Summary Statistics	2nd 8 Summary Statistics	3rd 9 Summary Statistics	4th 10 Attendance 1
7th Labor Day (No Class)	8th 11 Probability	9th 12 Probability	10th 13 Probability	11th 14 Quiz 1
14th 15 Binomial Distribution	15th 16 Binomial Distribution	16th 17 Binomial Distribution	17th 18 Binomial Distribution	18th 19 Attendance 2
21st 20 Normal Distribution	22nd 21 Normal Distribution	23rd 22 Normal Distribution	24th 23 Normal Distribution	25th 24 Quiz 2
28th 25 Central Limit Theorem	29th 26 Central Limit Theorem	30th 27 Central Limit Theorem	Oct 1st 28 Central Limit Theorem	2nd 29 Attendance 3
5th 30 Inference for Pop. Means	6th 31 Inference for Pop. Means	7th 32 Inference for Pop. Means	8th 33 Inference for Pop. Means	9th 34 Quiz 3 Last Day to Drop
12th 35 Inference for Pop. Props.	13th 36 Inference for Pop. Props.	14th 37 Inference for Pop. Props.	15th 38 Inference for Pop. Props.	16th 39 Attendance 4
19th 40 One-Way ANOVA	20th 41 One-Way ANOVA	21st 42 One-Way ANOVA	22nd 43 One-Way ANOVA	23rd 44 LSQA
26th 45 Two-Way ANOVA	27th 46 Two-Way ANOVA	28th 47 Two-Way ANOVA	29th 48 Two-Way ANOVA	30th 49 Attendance 5
Nov 2nd 50 Simple Linear Regression	3rd 51 Simple Linear Regression	4th 52 Simple Linear Regression	5th 53 Simple Linear Regression	6th 54 Quiz 4
9th 55 Multiple Linear Regression	10th 56 Multiple Linear Regression	11th Veterans Day (No Class)	12th 57 Multiple Linear Regression	13th 58 Homecoming
16th 59 Nonparametric Statistics	17th 60 Nonparametric Statistics	18th 61 Nonparametric Statistics	19th 62 Nonparametric Statistics	20th 63 Quiz 5

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
23rd 64 Miscellaneous Topics	24th 65 Miscellaneous Topics	25th Thanksgiving (No Class)	26th Thanksgiving (No Class)	27th Thanksgiving (No Class)
30th 66 Miscellaneous Topics	<div>Dec 1st</div> 67 Miscellaneous Topics	2nd 68 Miscellaneous Topics	3rd 69 Miscellaneous Topics	4th 70 Last Day of Class
7th Finals Week	8th Finals Week	9th Finals Week	10th Finals Week	11th Finals Week