

# STA 2171: Statistics for Biology

## Section 0002

Department of Statistics  
Florida State University  
Fall 2021

### 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. Students will need to follow the University's current health and safety guidelines.

- Tuesday & Thursday, 11:35 AM - 12:50 PM, HCB 0207
- Friday, 8:00 - 8:50 AM, HCB 0215

#### Instructor

- Name: Adam Dixon
- Email: ad18g@my.fsu.edu
- Office: OSB 209B
- Office Hours (In-person/Zoom): Tuesday & Wednesday, 1:15 - 2:15 PM, or by appointment

**Note:** I will be available for scheduled office hours and appointments both in-person and through Zoom. Links to Zoom meetings can be found on the course's Canvas site.

#### Grader

- Name: Yijia Ma
- Email: ym19f@my.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. We will teach you how to use a TI-84 series calculator, but we 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. The instructor will provide all required course notes and exercises.

### 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	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. Since this course is taught in-person, attendance is encouraged albeit **not mandatory**. While I will try to provide additional materials online for further study, I suggest you consider this content a supplement to – not a substitute for – regular, in-person attendance. Ultimately, it is important that you stay engaged with the course and do not fall behind.

To that end, there will be five (5) Attendance checks given through Canvas throughout the semester. These small assessments are intended to make sure you are interacting with the course at some level (in-person or online). As such, you will be given three (3) attempts and unlimited time for each Attendance check.

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

2. There will be five (5) timed 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) timed 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) timed, 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 on Monday, December 6, 2021.** 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 resource**, 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 collaborative work), 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 begin and 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 Classes (December 3, 2021).** 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**

Please note that the recorded lectures are the property of Florida State University and are made available only to the students enrolled in this class. Students are not permitted to share the recorded lectures with any other persons outside of this class. Copyrights of the recorded lectures 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 **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.

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

### **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.

## Make-Up Policy

**Make-ups are for being unable to begin and complete an 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 assessment.**

**If you are unable to begin and complete an 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 three (3) free make-ups (i.e., you can use them for any reason), 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 for Attendance or Quizzes will be given after the Last Day of Classes. If you are unable to submit the Final Exam during its availability, then you must email me immediately.**

**Note:** Since 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.

## 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/sites/g/files/upcbnu321/files/2020-09/Request\\_to\\_Reschedule\\_revised.pdf](https://artsandsciences.fsu.edu/sites/g/files/upcbnu321/files/2020-09/Request_to_Reschedule_revised.pdf)

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 will 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 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.

## 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>)

## 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.

To receive academic accommodations, a student:

1. must register with and provide documentation to the Office of Accessibility Services (OAS);
2. must provide a letter from OAS to the instructor indicating the need for accommodation and what type; and,
3. should communicate with the instructor, as needed, to discuss recommended accommodations. A request for a meeting may be initiated by the student or the instructor.

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 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](mailto:oas@fsu.edu)  
<https://dsst.fsu.edu/oas>

## 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/>



## Tentative Pacing Schedule

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

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8th	9th <b>34</b> Multiple Linear Regression	10th	11th VETERANS DAY (No Class)	12th <b>35</b> Multiple Linear Regression
15th	16th <b>36</b> MLR/Nonparam	17th	18th <b>37</b> Nonparam. Statistics	19th <b>38</b> <b>Quiz 5</b> NPS/Review
22nd	23rd <b>39</b> Misc. Topics	24th THANKSGIVING (No Class)	25th THANKSGIVING (No Class)	26th THANKSGIVING (No Class)
29th	30th <b>40</b> Misc. Topics	Dec 1st	2nd <b>41</b> Misc. Topics	3rd <b>42</b> LAST DAY OF CLASSES Misc. Topics
6th FINALS WEEK <b>Final Exam</b>	7th FINALS WEEK	8th FINALS WEEK	9th FINALS WEEK	10th FINALS WEEK