

# STA 2171: Statistics for Biology

## Section 0002

Department of Statistics  
Florida State University  
Spring 2021

### 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): By appointment only

**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: Yang Chen
- Email: cy16e@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.

## 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. 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) 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 during Finals Week (April 19, 2021 - April 23, 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 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.

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

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 (April 16, 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 submit one or more attempts for an assessment during its availability.** Make-ups will not be given due to undesired performance on an assessment.

**If you are unable to submit one or more attempts for 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 attempt(s) will receive a grade of zero (0).

**No make-ups 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.**

## 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 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/>), the University Counseling Center (<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>)

## Americans with Disabilities Act

[Download PDF Version of ADA](#)

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>

University Counseling Center  
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/>

## Academic Resources

Academic resources provided by the Office of Faculty Development and Advancement can be found at

<https://fda.fsu.edu/academic-resources>

## Tentative Pacing Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Jan 4th	5th	6th <b>1</b> <b>First-Day Attendance due at 8:00 PM</b>	7th <b>2</b> Summary Statistics	8th <b>3</b> Summary Statistics	9th	10th
11th <b>4</b> Summary Statistics	12th <b>5</b> Summary Statistics	13th <b>6</b> Summary Statistics	14th <b>7</b> Summary Statistics	15th <b>8</b> <b>Attendance 1 opens at 8:00 AM</b>	16th	17th <b>Attendance 1 due at 11:59 PM</b>
18th Martin Luther King, Jr. Day <b>No Classes</b>	19th <b>9</b> Probability	20th <b>10</b> Probability	21st <b>11</b> Probability	22nd <b>12</b> <b>Quiz 1 opens at 8:00 AM</b>	23rd	24th <b>Quiz 1 due at 11:59 PM</b>
25th <b>13</b> Binomial Distribution	26th <b>14</b> Binomial Distribution	27th <b>15</b> Binomial Distribution	28th <b>16</b> Binomial Distribution	29th <b>17</b> <b>Attendance 2 opens at 8:00 AM</b>	30th	31st <b>Attendance 2 due at 11:59 PM</b>
Feb 1st <b>18</b> Normal Distribution	2nd <b>19</b> Normal Distribution	3rd <b>20</b> Normal Distribution	4th <b>21</b> Normal Distribution	5th <b>22</b> <b>Quiz 2 opens at 8:00 AM</b>	6th	7th <b>Quiz 2 due at 11:59 PM</b>
8th <b>23</b> Central Limit Theorem	9th <b>24</b> Central Limit Theorem	10th <b>25</b> Central Limit Theorem	11th <b>26</b> Central Limit Theorem	12th <b>27</b> <b>Attendance 3 opens at 8:00 AM</b>	13th	14th <b>Attendance 3 due at 11:59 PM</b>
15th <b>28</b> Inference for Pop. Means	16th <b>29</b> Inference for Pop. Means	17th <b>30</b> Inference for Pop. Means	18th <b>31</b> Inference for Pop. Means	19th <b>32</b> <b>Quiz 3 opens at 8:00 AM</b> <b>Last Day to Drop</b>	20th	21st <b>Quiz 3 due at 11:59 PM</b>
22nd <b>33</b> Inference for Pop. Props.	23rd <b>34</b> Inference for Pop. Props.	24th <b>35</b> Inference for Pop. Props.	25th <b>36</b> Inference for Pop. Props.	26th <b>37</b> Inference for Pop. Props.	27th	28th

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Mar 1st <b>38</b> One-Way ANOVA	2nd <b>39</b> One-Way ANOVA	3rd <b>40</b> One-Way ANOVA	4th <b>41</b> One-Way ANOVA	5th <b>42</b> <b>LSQA</b> opens at <b>8:00 AM</b>	6th	7th <b>LSQA</b> due at <b>11:59 PM</b>
8th <b>43</b> Two-Way ANOVA	9th <b>44</b> Two-Way ANOVA	10th <b>45</b> Two-Way ANOVA	11th <b>46</b> Two-Way ANOVA	12th <b>47</b> <b>Attendance</b> <b>4 opens at</b> <b>8:00 AM</b>	13th	14th <b>Attendance</b> <b>4 due at</b> <b>11:59 PM</b>
15th <b>48</b> Simple Linear Regression	16th <b>49</b> Simple Linear Regression	17th <b>50</b> Simple Linear Regression	18th <b>51</b> Simple Linear Regression	19th <b>52</b> <b>Quiz 4</b> opens at <b>8:00 AM</b>	20th	21st <b>Quiz 4</b> due at <b>11:59 PM</b>
22nd <b>53</b> Multiple Linear Regression	23rd <b>54</b> Multiple Linear Regression	24th <b>55</b> Multiple Linear Regression	25th <b>56</b> Multiple Linear Regression	26th <b>57</b> <b>Attendance</b> <b>5 opens at</b> <b>8:00 AM</b>	27th	28th <b>Attendance</b> <b>5 due at</b> <b>11:59 PM</b>
29th <b>58</b> Nonparam. Statistics	30th <b>59</b> Nonparam. Statistics	31st <b>60</b> Nonparam. Statistics	Apr 1st <b>61</b> Nonparam. Statistics	2nd <b>62</b> Nonparam. Statistics	3rd	4th
5th <b>63</b> Misc. Topics	6th <b>64</b> Misc. Topics	7th <b>65</b> Misc. Topics	8th <b>66</b> Misc. Topics	9th <b>67</b> Homecoming <b>Quiz 5</b> opens at <b>8:00 AM</b>	10th	11th <b>Quiz 5</b> due at <b>11:59 PM</b>
12th <b>68</b> Misc. Topics	13th <b>69</b> Misc. Topics	14th <b>70</b> Misc. Topics	15th <b>71</b> Misc. Topics	16th <b>72</b> <b>Last Day</b> <b>of Classes</b>	17th	18th
19th Finals Week <b>Final</b> <b>Exam</b> opens at <b>8:00 AM</b>	20th Finals Week	21st Finals Week	22nd Finals Week	23rd <b>73</b> Finals Week <b>Final</b> <b>Exam due</b> at <b>11:59</b> <b>PM</b>	24th	25th