

# STA 2171: Statistics for Biology

## Section 0004

Department of Statistics  
Florida State University  
Spring 2020

### Course Information

#### Class Times and Location

- Monday & Wednesday, 5:15 - 6:30 PM, OSB 0110
- Friday, 12:20 - 1:10 PM, HCB 0213

#### Instructor

- Name: Adam Dixon
- Email: ad18g@my.fsu.edu
- Office: LOV 304B
- Office Hours: Tuesday & Wednesday, 3:45 - 4:45 PM, or by appointment

#### Grader

- Name: Yijia Ma
- Email: ym19f@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

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	Weight	Total Weight
Attendance	—	—	10%
LSQA	1	10%	10%
Midterm Exam	2	25%	50%
Final Exam	1	30%	30%
Total (before Extra Credit):			100%
Extra Credit			
Optional Homework	4	0.25%	1%
Exam Bonus Questions	—	—	4%
Grand Total:			105%

1. **Attendance is required and will be recorded each lecture.** Your attendance score will be the proportion of lectures you attend. However, given that unexpected events occur, you are allowed five (5) unexcused absences. If you have an excused absence (as defined in the University Attendance Policy), then you will have one (1) calendar week from the missed lecture date to send me appropriate documentation – documentation submitted after this period will not be accepted, and the absence will be unexcused.

If you expect to miss a lecture (e.g., due to a school activity or religious holiday), then please notify me and provide documentation in advance.

2. There will be one (1) Liberal Studies Quantitative Assessment (LSQA), a university-mandated assessment covering one topic.
3. There will be two (2) Midterm Exams, which will cover approximately the first two-thirds of the lecture material.
4. There will be one (1) cumulative Final Exam.
5. There will be four (4) optional, graded homework assignments which will count as extra credit. **Regardless if you decide to not submit homework assignments, I strongly recommend you complete, understand, and use them to study for exams.**

**The Final Exam is scheduled for Wednesday, April 29, 2020 in OSB 0110 at 5:30 - 7:30 PM.** Please see the Tentative Pacing Schedule (TPS) for all other assessment dates.

Final instructions will be given prior to the Midterm and Final Exams, but in general, you will be allowed:

- one (1) calculator (TI-84 or equivalent)
- one (1) 8.5 inches by 11 inches, **handwritten** note sheet, which may contain (on both sides) any information you wish to include  
Note: you will be allowed two (2) such note sheets for the Final Exam.
- Pens or pencils
- Scratch paper provided by me

Under no circumstances will you be allowed to:

- Share calculators with other students
- Share note sheets or scratch paper with other students
- Share answers or work with other students

If you are absent for an assessment, there may be make-up opportunities (see the Make-Up Policy). **Assessments that are not taken, and assignments that are not submitted, will receive a grade of zero. When a missed assessment/assignment is made up, 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 your assessment scores (reported as percentages rounded to two decimal places) and the weights given to those assessments, and your 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 (April 24, 2020).** Therefore, you should do your best throughout the entire semester.

## 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.

### 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 in my office within one (1) calendar week after your graded paper has been returned to you. 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 absences only.** Make-ups will not be given due to undesired performance on an assessment.

**Make-ups for missing homework deadlines will not be allowed without proper documentation.** If you have proper documentation, then you must submit the missed homework assignment and documentation to me within one (1) calendar week of the original due date.

If you are absent for the LSQA or a Midterm Exam, then please email me immediately. You will have until Thursday 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 one (1) make-up without providing documentation, but you must provide documentation for all other absences. 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 absent for the Final Exam, 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 take it to the Dean of Arts and Sciences office at 010 LON to get it approved, and

- (iii) bring the approved form back to me **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/>).

## 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 Student Disability Resource Center; and
2. bring a letter to the instructor indicating the need for accommodation and what type. This can be accomplished by logging in to the AIM system and electing to receive academic accommodations in this class so that an email notification will be sent to the instructor.

Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center 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:

Student Disability Resource Center  
874 Traditions Way  
108 Student Services Building  
Florida State University  
Tallahassee, FL 32306-4167  
(850) 644-9566 (voice)  
(850) 644-8504 (TDD)  
[sdrc@admin.fsu.edu](mailto:sdrc@admin.fsu.edu)  
<http://www.disabilitycenter.fsu.edu/>

## Tentative Pacing Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Jan 6th 1 Introduction	7th	8th 2 Summary Statistics	9th	10th 3 Summary Statistics
13th 4 Summary Statistics	14th	15th 5 Summary Statistics	16th	17th 6 Summary Statistics
20th <b>MLK Day (No Class)</b>	21st	22nd 7 Probability	23rd	24th 8 Probability
27th 9 Probability	28th	29th 10 Binomial Distribution	30th	31st 11 <b>Homework 1 Due</b> Binomial Distribution
Feb 3rd 12 Binomial Distribution	4th	5th 13 Normal Distribution	6th	7th 14 Normal Distribution
10th 15 Normal Distribution	11th	12th 16 <b>Midterm Exam 1</b>	13th	14th 17 Central Limit Theorem
17th 18 Central Limit Theorem	18th	19th 19 Central Limit Theorem	20th	21st 20 <b>Last Day to Drop</b> Inference for Population Means
24th 21 Inference for Population Means	25th	26th 22 Inference for Population Means	27th	28th 23 <b>Homework 2 Due</b> Inference for Population Proportions
Mar 2nd 24 Inference for Population Proportions	3rd	4th 25 Inference for Population Proportions	5th	6th 26 One-way ANOVA
9th 27 One-way ANOVA	10th	11th 28 <b>Midterm Exam 2</b>	12th	13th 29 One-way ANOVA
16th <b>Spring Break (No Class)</b>	17th <b>Spring Break (No Class)</b>	18th <b>Spring Break (No Class)</b>	19th <b>Spring Break (No Class)</b>	20th <b>Spring Break (No Class)</b>

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
23rd <b>30</b> Follow-Up Tests	24th	25th <b>31</b> <b>LSQA</b>	26th	27th <b>32</b> Two-way ANOVA
30th <b>33</b> Two-way ANOVA	31st	Apr 1st <b>34</b> Two-way ANOVA	2nd	3rd <b>35</b> <b>Homework 3 Due</b> Simple Linear Regression
6th <b>36</b> Simple Linear Regression	7th	8th <b>37</b> Simple Linear Regression	9th	10th <b>38</b> Multiple Linear Regression
13th <b>39</b> Multiple Linear Regression	14th	15th <b>40</b> Multiple Linear Regression	16th	17th <b>41</b> Nonparametric Tests
20th <b>42</b> Nonparametric Tests	21st	22nd <b>43</b> Nonparametric Tests	23rd	24th <b>44</b> <b>Homework 4 Due</b> Miscellaneous Topics <b>Last Day of Class</b>
27th	28th	29th <b>Final Exam OSB 0110 5:30 - 7:30 PM</b>	30th	May 1st