

STA 2171: Statistics for Biology

Section 0003

Department of Statistics
Florida State University
Fall 2019

Course Information

Class Times and Location

- Tuesday & Thursday, 3:35 - 4:50 PM, OSB 0110
- Friday, 1:25 - 2:15 PM, HCB 0214

Instructor

- Name: Adam Dixon
- Email: ad18g@my.fsu.edu
- Office: OSB 444
- Office Hours: Wednesday & Thursday, 2:00 - 3:00 PM, or by appointment

Grader

- Name: Sudipto Saha
- Email: ss18eo@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	1	10%	10%
Homework	4	3.75%	15%
LSQA	1	5%	5%
Midterm Exam	2	20%	40%
Final Exam	1	30%	30%
Total:			100%

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, five (5) unexcused absences will be dropped at the end of the semester. 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 four (4) graded homework assignments.

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

4. There will be two (2) Midterm Exams, which will cover approximately the first two-thirds of the lecture material.

5. There will be one (1) cumulative Final Exam.

The Final Exam is scheduled for Monday, December 9, 2019 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). If you miss an assessment and do not make it up according to the Make-Up Policy, then it will be given a grade of zero (0).

Grade Distribution	
Letter Grade	Numerical Grade
A	93 – 100
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 (December 6, 2019). 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.

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
<http://www.disabilitycenter.fsu.edu/>

Tentative Pacing Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Aug 26th	27th 1 Introduction	28th	29th 2 Summary Statistics	30th 3 Summary Statistics
Sep 2nd Labor Day (No Class)	3rd 4 Summary Statistics	4th	5th 5 Summary Statistics	6th 6 Summary Statistics
9th	10th 7 Homework 1 Due Probability	11th	12th 8 Probability	13th 9 Probability
16th	17th 10 Binomial Distribution	18th	19th 11 Binomial Distribution	20th 12 Binomial Distribution
23rd	24th 13 Normal Distribution	25th	26th 14 Normal Distribution	27th 15 Normal Distribution
30th	Oct 1st 16 Central Limit Theorem	2nd	3rd 17 Homework 2 Due Central Limit Theorem	4th 18 Central Limit Theorem
7th	8th 19 Inference for Population Means	9th	10th 20 Midterm Exam 1	11th 21 Inference for Population Means
14th	15th 22 Inference for Population Means	16th	17th 23 Inference for Population Proportions	18th 24 Inference for Population Proportions
21st	22nd 25 Inference for Population Proportions	23rd	24th 26 LSQA	25th Homecoming (No Class)
28th	29th 27 Nonparametric Tests	30th	31st 28 Nonparametric Tests	Nov 1st 29 Nonparametric Tests
4th	5th 30 Homework 3 Due One-way ANOVA	6th	7th 31 One-way ANOVA	8th 32 One-way ANOVA

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
11th Veterans' Day (No Class)	12th 33 Two-way ANOVA	13th	14th 34 Midterm Exam 2	15th 35 Two-way ANOVA
18th	19th 36 Two-way ANOVA	20th	21st 37 Simple Linear Regression	22nd 38 Simple Linear Regression
25th	26th 39 Homework 4 Due Simple Linear Regression	27th Thanksgiving (No Class)	28th Thanksgiving (No Class)	29th Thanksgiving (No Class)
Dec 2nd	3rd 40 Multiple Linear Regression	4th	5th 41 Multiple Linear Regression	6th 42 Multiple Linear Regression Last Day of Class
9th Final Exam OSB 0110 5:30 - 7:30 PM	10th	11th	12th	13th