

# STA 2122 Introduction to Applied Statistics

## Section 016 Fall 2020

### **BASIC INFORMATION:**

**Instructor:** Mr. Zhiyuan Yu

**Email:** zy16@my.fsu.edu

**Office Hours:** By appointment

This class will be taught **remotely and asynchronously** on Canvas (canvas.fsu.edu) from August 24th and end December 4th. We will not be using Honorlock.

I will post class videos to Canvas every Wednesday morning.

### **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.

### **COURSE DESCRIPTION:**

**Credit Hours:** 3

**Prerequisite:** A grade of “C-“ or better in MAC 1105 College Algebra (or equivalent).

**Special Note:** Subsequent credit for STA 5126 is not permitted. No credit is given for STA 2122 if a grade of “C-“ or better is earned in STA 2171, STA 3032, or QMB 3200.

The course covers Normal distributions, sampling variation, confidence intervals, hypothesis testing, one-way and two-way analysis of variance, correlation, simple and multiple regression, contingency tables and chi-square tests, non-parametric statistics.

The purpose of this course is to prepare students for further study and job preparation in the field of Natural Sciences. 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.

**REQUIRED MATERIALS:**

- A personal computer, reliable internet connection, and Chrome or Firefox browser.
- A TI-84 Plus or equivalent calculator. We will help you to learn how to use a TI-84 series calculator, but we cannot promise to be able to help with any other type of calculator.
- A textbook is not required for this class.

**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:

- (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 2122, 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.

**TOPICS COVERED:**

1. Simple random sample; Graphs: histograms and segmented bar charts.
2. Summary Statistics: mean, quartiles, range, standard deviation, five-number summary, boxplot, IQR, identifying outliers, z-score as the number of standard deviations from the mean, and Empirical rule.

3. Normal Distribution: forward and backward problems; Central Limit Theorem
4. One-sample Mean: obtain and interpret z-intervals and t-intervals, the concept of confidence level, sample size calculation, carry out and interpret results of z-test, t-test, and p-value; Type I & II error.
5. One-way ANOVA F-test; Two-way ANOVA F-test.
6. Correlation; Simple Linear Regression; Simple Linear Regression Inference.
7. Chi-square Test of Independence.
8. Non-parametric Tests.

### **EMAIL:**

1. We will communicate with you by sending emails to your @my.fsu.edu account and posting announcements on the course website. Please check your FSU email and the Canvas announcements every day.
2. Please turn on the course notifications on Canvas by going to Account / Notifications / and checking the Notify me right away option for all of the items under Course Activities.
3. Please send assessment-related questions at least 24 hours before the assessment is due to begin.
4. If you email us, please send it from your @my.fsu.edu account.
5. Be aware that email sent from outside the FSU domain may not get through to us, so if you send an email and you don't get a response within two working days, please try to meet us in person before class, or after class, or during office hours.

### **ATTENDANCE, ABSENCE, AND DROP/WITHDRAWAL:**

1. Drop and Withdrawal deadlines are given in the University's academic calendar at <https://registrar.fsu.edu/calendar/>.
2. First-day attendance will be taken electronically on the course website.
3. You are expected to adhere to all assessment deadlines.
4. Lack of future planning, or mismanagement of time and other resources, are not acceptable reasons for missing assessment deadlines.
5. Bear in mind that the opportunities presented in this class are made equally available to all students in the class and it is up to each individual to make the most of these opportunities.

6. In the interests of fairness, we will not do for one student what we cannot do for all students who are likely to request the same.

7. Documentation for missing assessment deadlines will not be accepted after the Last Day of Class.

### **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.

### **ASSESSMENT:**

We do not allow make-up exams and grade improvement after the last day of class, so please do your best during the term.

Quizzes and final exam will be “open-note” which means that the following resources may be used during quizzes and exam: class notes, assignments, personal notes (these are notes that you can take while preparing/studying for quizzes), textbooks. Resources that may not be used during quizzes: any and all people (including classmates etc.), the internet.

#### **1. Final Exam (20%)**

- a. The Final Exam will be highly correlated with class notes and assignments.
- b. **You have two attempts to finish the final exam.**
- c. You may bring a calculator.
- d. Discussing with other students is prohibited during the final exam.

#### **2. Timed Quizzes (50%)**

- a. **The quiz with the lowest grade will be dropped (Liberal Studies Quantitative Assessment (LSQA) cannot be dropped).**
- b. **You have two attempts to finish each quiz.**
- c. All quizzes will be highly correlated with class notes and examples.
- d. You may bring a calculator.
- e. Discussing with other students is prohibited during quizzes.

3. **Assignments (30%)**
  - a. **The assignment with the lowest grade will be dropped.**
  - b. **You have unlimited attempts to finish each assignment.**
  - c. Doing assignments is an excellent way to prepare for quizzes and exam.
4. **Bonus Assignment (5%)**
  - a. It includes a practical question, which you need to use statistical methods to solve.

If you believe that a correct answer was counted as incorrect on a quiz and final exam, please email me about it within **two** days after you submit the quiz. If it turns out that your answer was correct, you will be given credit for it.

### **NOTE ON TECHNOLOGY-DEPENDENT ASSESSMENTS:**

This course is heavily technology-dependent. While we will do our best to work with you on technology issues, please be aware that if you take an assessment but we can find absolutely no record of the fact, then we 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**.

### **MISSED ASSESSMENT:**

#### **1. Quizzes**

If you were absent from one of the quizzes with an acceptable documentation, you may make it up during my office hours or email me to make an appointment. Please note that (1) you can only make up one quiz, (2) you must have acceptable documents, and (3) you need to make it up within one week after the due date.

### **OVERALL COURSE GRADE:**

1. If you believe that a paper was improperly graded, report to me right after the class you received your homework or quiz paper. Delayed report will not be resolved.
2. If a grade is not posted within one week after homework or quiz, we will do our best to locate your missing grade.
3. Overall numerical course grade  

$$=0.2*\text{Final Exam} + 0.5*\text{Quizzes} + 0.3*\text{Assignments} + 0.05*\text{Bonus}$$

Note: rounded UP to the next higher whole number.

Letter	Final Grade	Letter	Final Grade
A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	0-59

Usually, I will curve the final grade depends on class performance.

### **HOW TO SUCCESSFULLY COMPLETE THIS CLASS:**

For each topic:

- ~ Watch the relevant lecture video(s),
  - ~ Study the information and examples in the class notes thoroughly,
  - ~ Do all of the assignments,
  - ~ Study the solutions even if you get the answers right because the solutions can provide insights to the problems,
  - ~ Make sure you know how to use your calculator appropriately,
  - ~ (Optional) Do extra problems posted in Canvas. Practice makes perfect!
- Remember that you can email us or come to office hours if you need help.

### **TENTATIVE SCHEDULE:**

Note: This schedule is tentative and might be changed based on class progress.

Week 1 (8/24-8/30): Introduction, Summary Statistics

Week 2 (8/31-9/6): Summary Statistics, Normal Distribution

Week 3 (9/7-9/13): Normal Distribution, Assignment 1, Quiz 1

Week 4 (9/14-9/20): Central Limit Theorem, One-sample Confidence Interval

Week 5 (9/21-9/27): One-sample Confidence Interval

Week 6 (9/28-10/4): One-sample Hypothesis Testing, Assignment 2, LSQA Quiz

Week 7 (10/5-10/11): One-way ANOVA

Week 8 (10/12-10/18): Two-way ANOVA, Assignment 3, Quiz 3

Week 9 (10/19-10/25): Simple Linear Regression

Week 10 (10/26-11/1): Simple Linear Regression

Week 11 (11/2-11/8): Multiple Linear Regression, Assignment 4, Quiz 4

Week 12 (11/9-11/15): Chi-square test

Week 13 (11/16-11/22): Non-parametric test, Assignment 5, Quiz 5, Bonus Assignment

Week 14 (11/23-11/29): Thanksgiving week, no classes

Week 15 (11/30-12/6): Final exam review classes

Week 16 (12/7-12/11): Final exam

### **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>.)

### **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/>).

### **STUDENTS SWITCHING SECTIONS:**

When you switch sections, your grades are permanently deleted from your old Canvas section website. Always inform us before you switch so that we may keep a copy of your previously earned grades.

**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 should be done during the first week of class.

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/>

**COPYRIGHT:**

Watching the lecture videos is equivalent to attending class and listening to lectures. We acknowledge that the lecture videos are not short, but remember that class time would have been 50 or 75 mins - 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, we 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.

Please note that the recorded lectures are the property of Florida State University and are made available only to 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.