



Fall 2022

Florida State University, Department of Statistics

Main office 214 OSB, phone 850-644-3218.

FSU Police non-emergency: 850-644-1234.

Emergency: 911.

## STA 1013: Statistics Through Example

*Spring 2023 – Section 0014/0018*

### Course Information

Instructor: Xu Liu

Email: xl18@fsu.edu

Office Hours: **Wednesday 11:00 AM – 12:00 PM(Section 00014) and 1:00 PM – 2:00 PM(Section 0018) at OSB 403.** (Students can email me to set another time if they can't make the regular office hour)

Course Format: Face-to-Face/F2F (in-person in a classroom)

Class Times and Locations: Jan 9<sup>th</sup> ~ May 5<sup>th</sup> (Including final's week) .

Section 0014 OSB\_0110 MWF 16:50 -17:40

Section 0018 LOV\_0301 MWF 15:05 -15:55

Final exam time and location(classroom):

**Section 0014 Monday (May 1<sup>st</sup>) 17:30 – 19:30**

**Section 0018 Thursday (May 4<sup>th</sup>) 15:00 – 17:00**

I will not be using Honorlock. Students will need to follow the University's current health and safety guidelines.

### F2F Classes Process:

Please note that, for each class period, if no students show up within the first 15 minutes, or if there is a 15-minute stretch of time when no students show up after the last student has left, then the rest of the period will be cancelled. The next lecture will begin where the cancelled lecture would have left off, and the next assessment will include the material that would have been taught in the cancelled lecture.

### Important Dates

+ Classes start Mon Jan 9<sup>th</sup> and end Fri Apr 28<sup>th</sup> (16 weeks).

+ Drop/add ends at 11:59pm **Thu Jan 13<sup>th</sup>**.

+ Grades are due at 4:00pm on TUESDAY May 9<sup>th</sup> .

+ Last day to drop a course without receiving a grade is **Fri Feb 24<sup>th</sup>** . Please give at least one major test (or several quizzes, or the equivalent) and have the grades posted on Canvas BY ONE WEEK BEFORE THIS DATE so that students will have some idea of how they're doing in your class and will be able to make an informed decision as to whether they should drop the class or not, or request a different type of grading, etc.

+ For other important days, see the University's Academic Calendar at <https://registrar.fsu.edu/calendar/>.

Course website: <https://canvas.fsu.edu>

Canvas Support

Email: [canvas@fsu.edu](mailto:canvas@fsu.edu)

Phone: 850-644-8004

Website: <https://support.canvas.fsu.edu/home/>

Hours: 8am-5pm, Mon-Fri

Please turn on the course notifications in Canvas by going to Account/Notifications and selecting the *Notify immediately* option for all of the items under Course Activities.

Please check your FSU email and the course announcements every day.

If you communicate with me via email, please use your [@fsu.edu](mailto:yourname@fsu.edu) account.

## Course Description

Credit Hours: 3

Prerequisite: None

This course provides students with a background in applied statistical reasoning. Fundamental topics are covered including graphical and numerical description of data, understanding randomness, central tendency, correlation versus causation, line of best fit, estimation of proportions, and statistical testing.

Statistical thinking, relevant ideas, themes, and concepts are emphasized over mathematical calculation. In this class students learn many of the elementary principles that underlie collecting data, organizing it, summarizing it, and drawing conclusions from it.

## Learning Objectives

This course has been approved to meet FSU's Liberal Studies **Quantitative and Logical Thinking** requirements and helps 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 (LSQA) which includes a written summary of results. **The LSQA forms a mandatory ten percent of the course grade. If you do not take it, you will not be permitted to pass the class, regardless of how well you perform on the other assessments.** The LSQA will be an online assessment graded for accuracy; two attempts will be allowed; collaboration is not permitted; no internet sources are allowed apart from the course Canvas.

3. Apply sound concepts of sample selection and experimental design in producing data.
4. Use statistical thinking in the context of work processes, academic endeavors, and everyday life.
5. Describe how inferential statistical methods are used to make valid judgments based on the data.
6. Evaluate the validity of statistical results with skepticism based on sensible considerations.

## Tentative Topics:

1. Terminology/Initial ideas: population, sample, parameter, statistics, categorical, quantitative
2. Sampling: simple random sample, systematic sampling, stratified sampling, cluster sampling, convenience sampling
3. Graphs: histograms (sketch and interpret), bar charts (sketch and interpret), pie charts (interpret)
4. Summary statistics: mode, mean, quartiles, range, standard deviation, five-number summary, boxplot

5. Empirical rule
6. Normal Distributions: forward problems (finding area under the curve/percentage of data)
7. Central Limit Theorem: sampling distributions of  $\bar{x}$ , features of the distributions and implications when using a larger/smaller sample to estimate  $\mu$ , forward problems (finding probabilities)
8. Probability: random process, four rules, probability models, addition rule for mutually exclusive events
9. Random Variables: definition, expected values
10. One-sample mean: obtain and interpret z-intervals, carry out and interpret results of z-test, interpret P-value
11. One-proportion: z-intervals and z-tests
12. Correlation: what the sign and absolute value of  $r$  imply, correlation does not imply cause-and-effect
13. Simple Linear Regression: read scatterplots, given equation make prediction, interpret R-squared

### Required Materials

- A personal computer, reliable internet connection, and **Chrome or Firefox** browser.
- A **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.

A textbook is not required for this class. The instructor will provide all required course notes and exercises. Please note that the materials provided by the instructor were put together for your individual use only. We ask that you do not share them, especially with third parties who are not enrolled in this class. If you seek help outside of class, then you may, of course, allow your helper to see the materials, but please do not allow them to make copies or in any other way take our material. We appreciate your co-operation in protecting our material. Thank you!

### Additional Resource

The following free online textbook is an additional resource that you might find useful: Introductory Statistics from OpenStax, Print ISBN 1938168208, Digital ISBN 1947172050, [www.openstax.org/details/introductory-statistics](http://www.openstax.org/details/introductory-statistics).

### Note on Technology-dependent Assessments

This course is 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.**

### Completing assessments in a timely manner so that you can stay on track

This is a semester-long college course, designed to be taken one step at a time throughout the semester rather than hurriedly over the span of a few days, or a few weeks. We will therefore not allow extensions on due dates during the last two weeks of classes unless you have completed at least eighty percent of the assessments given up to that point, including the LSQA. For example, if the LSQA and nine other assessments have been given by the start of the last two weeks of classes, then you will need to have completed the LSQA and at least seven other assessments in order to receive any extensions on due dates during the last two weeks of classes. Please note that the assessments need to be completed in order. Therefore, an extension on a specific assessment will not be granted if you have prior outstanding assessments. For example, if you request an extension on Assessment 8 but you did not complete Assessment 3, then you will be denied an extension on Assessment 8 but you may receive an extension on Assessment 3. The last day of classes will be the deadline for all assessment submissions, including assessments where extensions were granted, but not including the final assessment.

## Grades

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. **All the quizzes are online format but students need to take the quiz in person in class.**

If you believe that the grade you received on an assessment is incorrect, please bring it to my attention within 48 hours after the grade has been made available to you. If no issues are raised during that 48-hour time frame, then it will be assumed that the grade is accepted and subsequent requests for a grade review may not be granted.

**Quiz (50%):** There will be 4 quizzes during the semester. Collaboration is allowed only for Quiz 2. For each quiz students have 2 attempts.

**Collaboration (10%):** The collaboration is assigned based on the course slides (group work on practices). Collaboration will be given at least once a week, not graded for accuracy,

**LSQA(10%):** Note that, STA1013 has been certified as one of FSU's Liberal Studies Quantitative and Logical Thinking courses. As a requirement, administer the appropriate Liberal Studies Quantitative Assessment (LSQA) during the semester. This will be a common assessment (not final exam). It will be part of the Quiz 2 and the total time length will be about 50 mins. Collaboration is not allowed. **Remember the LSQA is required to pass this course.**

**Final Exam (30%):** There will be a cumulative final exam given on the final exam week. **If you need to miss the final, you must notify the instructor in advance.** Collaboration is not allowed.

All assessments will be open-book which means that the following resources may be used during quizzes and final exam: lecture notes, personal notes, textbooks. Each assessment will be available online for 24 hours. You will have TWO attempts for each assessment. Due dates for each assessment will be provided on Canvas. There should be absolutely no late submission for any assessments. Assessments that are not taken will receive a grade of zero. When a missed assessment is made up, the zero will be replaced with the earned grade. Grades will be posted on Canvas within one week. After a grade is posted the student has 5 workdays to request a grade change. After a grade has been posted for one week, no grade changes will be made.

## Grading scale:

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

A request for a grade of "Incomplete" will

~ NOT be granted if you have completed the coursework, including the assessments that cannot be dropped and excluding the drops and allowable absences.

~ be granted only if **both** of the following conditions are satisfied:

- (1) the only assessment that you have yet to take is the final assessment, and
- (2) your overall average excluding the final assessment is a passing grade (70% or above).

## Tentative Pacing Schedule:

Week	Dates	Day 1	Day 2	Day 3
1	Jan 9 ~Jan 13	Syllabus	Terminology	Sampling
2	Jan 16 ~ Jan20	<b>MLK Day. No class.</b>	Graphs	Graphs
3	Jan 23 ~ Jan27	Summary statistics	Summary statistics	Review
4	Jan30 ~ Feb 3	Quiz 1 (collaboration not permitted)	Empirical rule	Normal Distributions
5	Feb 6 ~ Feb 10	Normal Distributions	Normal Distributions	Normal Distributions (Practice)
6	Feb13 ~ Feb 17	Central Limit Theorem	Central Limit Theorem	Central Limit Theorem
7	Feb 20 ~Feb 24	Central Limit Theorem	Review	Quiz 2 (collaboration permitted)
8	Feb 27 ~ Mar 3	Probability	Probability	Probability
9	Mar 6 ~ Mar 10	LSQA (collaboration not permitted)	Probability	Random Variables
10	Mar 13- Mar 17	<b>Spring Break, No Classes.</b>		
11	Mar 20 ~ Mar 24	Random Variables	Review	Quiz 3 (collaboration not permitted)
12	Mar 27 ~ Mar 31	One-sample mean	One-sample mean	One-sample mean
13	Apr 3 ~ Apr 7	One-proportion	One-proportion	Review
14	Apr 10 ~Apr 14	Quiz 4 (collaboration not permitted)	Correlation	Simple Linear Regression
15	Apr 17 ~ Apr 21	Simple Linear Regression	Simple Linear Regression	Simple Linear Regression
16	Apr 24 ~ Apr 28	Simple Linear Regression	Review 1	Review 2
17	May1 ~ May 5	Final Exam (collaboration not permitted)		

## Sexual Misconduct and Title IX Reporting

As an instructor, I am obliged to report all instances of sexual misconduct and other Title IX issues 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 & Psychological Services (<https://counseling.fsu.edu/>), the Employee Assistance Program (<https://eap.fsu.edu/>), University Health Services (<https://uhs.fsu.edu/>), or pastoral counselors. If you would like to submit a report to the University's Title IX Director, please go to <https://report.fsu.edu/>.

## 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 should talk to me about it first to get my approval and then fill out and follow the instructions on the “Request to Reschedule a Final Examination” form at [https://artsandsciences.fsu.edu/sites/g/files/upcbnu321/files/2022-01/Request to Reschedule\\_01032022.pdf](https://artsandsciences.fsu.edu/sites/g/files/upcbnu321/files/2022-01/Request_to_Reschedule_01032022.pdf).

The form needs to be submitted to the College of Arts and Sciences before 5pm on 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.

### **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. Drop and Withdrawal deadlines are given in the University's academic calendar at <https://registrar.fsu.edu/calendar/>.

### **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/academic-resources/academic-integrity-and-grievances/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 Department of Student Support and Transitions 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.

Students with disabilities needing academic accommodation should:

- (1) register with and provide documentation to the Office of Accessibility Services; and
- (2) request a letter from the Office of Accessibility Services to be sent to the instructor indicating the need for accommodation and what type; and,
- (3) meet (in person, via phone, email, skype, zoom, etc...) with each instructor to whom a letter of accommodation was sent to review approved accommodations.

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 the latest version of this statement and 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>

Academic accommodations will be provided as soon as possible after verification is received. Academic accommodations are not retroactive, so they will not apply to lectures/lessons and assessments that took place before verification was received.

### 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 <a href="https://dsst.fsu.edu/vap">https://dsst.fsu.edu/vap</a>	Counseling and Psychological Services Askew Student Life Center, 2nd floor 942 Learning Way (850) 644-8255 <a href="https://counseling.fsu.edu/">https://counseling.fsu.edu/</a>	University Health Services Health and Wellness Center (850) 644-6230 <a href="https://uhs.fsu.edu/">https://uhs.fsu.edu/</a>
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### Disaster

At times of severe weather or other disasters, please check your FSU email, your text messages, the Seminole Safe App and FSU Alerts (<https://alerts.fsu.edu/>) as often as you can to keep yourself informed. In the absence of internet access, you may call 850- 644-4636 for updates. Check for the latest information every day before you leave home so that you don't miss any last minute announcements. If the University closes due to a disaster, we will all be informed via the above means, and classes and office hours will be automatically cancelled even if I don't announce it. As long as the University remains open, classes will still be on. However, please practice safety first. If it will be unsafe for you to come to class due to the effects of a disaster, please do not attempt to come in. You will not be penalized, we will work with you.

You can sign up to receive alerts via SMS text messages here: <https://emergency.fsu.edu/services/fsu-alert-emergency-notification-warning-system/fsu-alert-sms-text-messages>.

See here for other ways in which FSU delivers warnings: <https://emergency.fsu.edu/services/fsu-alert-emergency-notification-warning-system>.

### 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.

### Classes Subject to HB233 Recording

In this class, consistent with state law and university policy, students are permitted to make recordings of class lectures for personal use only. As noted, sharing, posting, or publishing classroom recordings may subject you

to honor code violations and legal penalties associated with theft of intellectual property and violations of other state law. Moreover, students and educators have expressed concern that recording classroom activities may negatively impact the learning experience for others, especially in classes that involve questions, discussion, or participation. To protect a learning environment in which everyone feels free to experiment with ideas, we ask you refrain from recording in ways that could make others feel reluctant to ask questions, explore new ideas, or otherwise participate in class. Students must monitor their recording so that they do not include participation by other students without permission. Students with disabilities will continue to have appropriate accommodations for recordings as established by the Office of Accessibility Services.