

STA 1013: Statistics Through Example

Spring 2020 – Section 0016

Course Information

Instructor: Zishen Xu

Email: zx16@my.fsu.edu

Office Hours: Friday, 3:30 pm - 5:00 pm or by appointment

Office Location: LOV 428

Class Times and Locations: Jan 6th ~ April 24th, 2020, MWF, 1:25 pm – 2:15 pm, HCB 0207

Required Course Resources

Textbook: There is no required textbook for this course. The notes and relevant materials will be posted to Canvas before class. Some suggested readings are:

- *Statistical Reasoning for everyday life, 5th ed. by Bennet Briggs Triola.*
- *Elementary Statistics, 7th ed, by Mario F. Triola*

Calculator: A scientific calculator is required. The ideal model is TI-84 Plus CE from Texas Instrument. In class, I will teach only this model on how to do the computation. You will need to learn by yourself if you decide to use other type of calculators. Cell phones are not permitted as calculators during exams and quizzes.

Canvas Class Website: Grades, notes, announcements and other pertinent information will be available through this site. You are responsible for assignments and announcements posted on this website, as well as those sent through your FSU email. Please check your FSU email and Canvas daily.

Course Description

Prerequisite: None

Credit Hours: 3

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.

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.
- 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: statistical study process, population, sample, parameter, statistic, categorical, quantitative
2. Sampling: simple random sampling, systematic sampling, stratified sampling, cluster sampling, convenience sampling
3. Graphs: histograms (sketch and interpret), stemplots (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 μ , forward problems (finding probabilities)
8. Probability: random processes, four rules, probability models, addition rule for mutually exclusive events
9. Random Variables: definition, expected value
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

Tentative Pacing Schedule:

| | | Mon | Wed | Fri |
|--------------|-----------------|---|-------------|-----------------------------------|
| Week 1 | Jan 6 ~ Jan 10 | Introduction to the course | Topic 1 & 2 | Topic 3 |
| Week 2 | Jan 13 ~ Jan 17 | Topic 3&4 | Topic 4 | Topic 4 |
| Week 3 | Jan 20 ~ Jan 24 | Martin Luther King, Jr. Day No class | Topic 4 | Topic 4&5 |
| Week 4 | Jan 27 ~ Jan 31 | Quiz 1 | Topic 5 | Topic 6 |
| Week 5 | Feb 3 ~ Feb 7 | Topic 6 | Topic 6&7 | Topic 7 |
| Week 6 | Feb 10 ~ Feb 14 | Topic 7 | Topic 7 | Topic 7 |
| Week 7 | Feb 17 ~ Feb 21 | Quiz 2 | LSQA Test | Topic 8 Last day to drop class |
| Week 8 | Feb 24 ~ Feb 28 | Topic 8 | Topic 8 | Topic 8 |
| Week 9 | Mar 2 ~ Mar 6 | Topic 8&9 | Topic 9 | Topic 9 |
| Week 10 | Mar 9 ~ Mar 13 | Quiz 3 | Topic 10 | Topic 10 |
| Spring Break | Mar 16 ~ Mar 20 | No class | | |
| Week 11 | Mar 23 ~ Mar 27 | Topic 10 | Topic 10 | Topic 11 |
| Week 12 | Mar 30 ~ Apr 3 | Topic 11 | Topic 11 | Topic 11 |
| Week 13 | Apr 6 ~ Apr 10 | Quiz 4 | Topic 12 | Topic 12 |
| Week 14 | Apr 13 ~ Apr 17 | Topic 12 | Topic 13 | Topic 13 |



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|---------|-----------------|----------|----------|----------------|
| Week 15 | Apr 20 ~ Apr 24 | Topic 13 | Topic 13 | Review and Q&A |
|---------|-----------------|----------|----------|----------------|

Note that this is only a plan for the course. The real schedule may be changed according to the actual situation, e.g. if a hurricane occurs, I will be able to omit but still stay on track if the University closes due to weather conditions.

Liberal Studies for the 21st Century: Quantitative and Logical Claims

The Liberal Studies for the 21st Century Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive both intellectually and materially and to support themselves, their families and their commitments through a broad and critical engagement with the world in which they live and work. This course has been approved as meeting the Liberal Studies requirements and this is designed to help you become a critical analyzer of quantitative and logical claims. **In order to fulfill the state of Florida’s College mathematics and computational requirement, the student must earn a C- or better in the course.**

Grades

Quizzes (50%): There will be 4 quizzes during the semester, which add up to 50% of the final grade. The quizzes are not equally weighted. The one where you achieve the highest score will be 20% and the other three will be 10% each. Each quiz will contain some extra credits for you to work on. You could bring **one 8.5” x11” (A4) hand-written double-side** cheat sheet and a **calculator** to the quizzes.

LSQA (10%): Note that, STA 1013 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). Time length will be about 50 mins (one lecture time).

Final Exam (30%): There will be a **cumulative** final exam given at **5:30-7:30 pm, Tuesday, April 28th at our usual classroom**. At the final exam, you could also bring **three 8.5” x11” (A4) hand-written double-side** cheat sheet and a **calculator**.

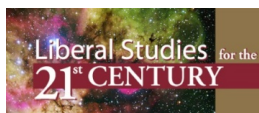
Attendance (10%): **Attendance will be checked every class** by class roster during the semester. There are overall 36 lectures without the classes in the first week and the quizzes / exams. If you miss no more than 4 classes (need to attend 32 or more classes), you will receive all the 10% (i.e. you are free to miss at most 4 lectures). Otherwise every missing class exceed 4 will cause 2% deduction in the attendance score, which means if you miss 9 or more classes (attend 27 or less classes), you will receive 0% on the attendance. If you miss the roster signing for any reason but have shown up in the class, **wait for the end of the class and come to me to sign it. Do not stand up asking others for the roster**. (This means, if you miss the attendance check due to coming late and also you want to leave early, then **you will be count as missing**)

Grades will be posted on Canvas. The quiz / exam papers will **not** be given back to the students, but I will go over the quiz / exam questions in the following lecture and also post the questions and answers on Canvas. When a grade is posted, you have **one week** to request a grade change. If you have any concern about your score, please ask me and I will show you your quiz / exam paper. After this one-week period, no grade changes will be made.

The grading scale for the course is as follows:

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

The overall grade will be calculated by the way described above and may be subject to a curve in the end of the semester (this will only make your grade unchanged or higher). **Do not treat the ‘Total’ shown on Canvas / Grades as your overall grade / score.** That one is computed in a wrong way and unfortunately cannot be fixed. I



will provide a grade calculator, which will be on Canvas / Files, for those of you who want to compute their overall total scores.

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.

Extra-credit: In each quiz and the final exam, there will be some extra-credit questions. The points of those questions will be treated the same as the regular questions but will not be used when computing the maximum score for the quiz / final exam. For example, quiz 1 has 20-points regular questions and 5-points extra-credit questions, so the maximum score for quiz 1 will be 20. If one student gets 18 for regular and 4 for extra-credit, then his / her score will be 22 for quiz 1, which is $22/20 * 10\% = 11\%$ of the overall total score. Therefore, the maximum overall total score is possible to be over 100, but as there is no 'A+' grade, an overall total score more than 100 will still result in an 'A'.

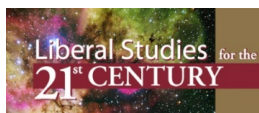
Policy Information:

Make-up Policy:

- If you have missed a quiz and want to make up, you need to contact me within **TWO** calendar days after the quiz day or inform me in advance, and provide university approved documentation, which includes: documented illness, deaths in the family and other documented crises as approved by the Dean of Students office, active military or jury duty, religious work-restricted holy days, and official University activities. Please note that the FSU University Health Services 'Verification of Visit' does not constitute a documented absence. Unexcused absence from a quiz will result in a zero. The make-up quiz will be given within one week of the original quiz date. I will discuss the detail time and location with you after receiving the documentation.
- If you have missed an attendance check and do not want it to be count as one missing class, same as the policy for the quizzes, you can contact me within **TWO** calendar days after the day that you missed the class or inform me in advance, and provide university approved documentation.
- If you are going to miss the final exam, you must notify me and Radha Bose (rbose@fsu.edu) in advance at the same time.
- If you are going to miss a quiz or an attendance check due to religious holiday, please send me an email informing me the details of the holiday with your name in the end via your FSU email account within **TWO** calendar days after the day you missed or in advance. No other documentation will be required. Otherwise no make-up quiz or attendance will be given.
- If you miss some lectures, to catch up with the others, please read the lecture notes of the missed classes yourself and discuss with me if there is anything unclear.

Classroom Conduct: You are expected to act professionally in the classroom. You should arrive on time and prepared for the class. If you do arrive late or have to leave early, please do so in a manner that does not disturb the others. No food is allowed and please stay seated during the lecture. If you have any emergency, please raise your hand to let me know first. Discussion is allowed but please keep your voice level low so that others will not be disturbed. **If you have any question, please feel free to discuss with me during class, after class, during office hours or sending emails. Please come to me for help first, before reaching out for others such as tutors.**

Email and Canvas: I will send announcements to your FSU email account (@my.fsu.edu) or on Canvas. You are responsible for all information sent via email or put on Canvas website, so check your FSU email account and Canvas website frequently (at least one time a day). When emailing me regarding this class, please put STA1013-0009 in the subject line, sign your full name in the end and use your FSU email account. **Emails not from FSU email account will not be replied**. I will respond to all emails within two business days, which do not include weekends, holidays or weekdays after 7 pm. Asking me early, do not expect me to save you in the last minute!



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/>

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.

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/>), or University Health Services (<https://uhs.fsu.edu/>).



STA 1013 Spring 2020
Department of Statistics
Florida State University

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

- 1) talk to me about it first and get my permission to reschedule,
- 2) fill out the “Request to Reschedule Final Examination” form at

<https://artsandsciences.fsu.edu/students/undergraduate/forms-requiring-deans-approval/reschedulingfinal-examination> and take it to the Dean of Arts and Sciences office at 010 LON to get it approved, and

- 3) 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.