STA 2023: Introduction to Statistics I

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3rd MWF lecture (R 4nd period lab - 408E)
3rd MWF lecture (R 5rd period lab - 408E)

Review/ Homework Sessions: Every Thursday 7 to 9pm in Griffin Floyd 230

THIS COURSE SATISFIES GENERAL EDUCATION CREDITS IN THE MATHEMATICAL SCIENCES. STUDENTS LEARN HOW TO SUMMARIZE DATA AND HOW TO MAKE APPROPRIATE DECISIONS BASED ON DATA. (This course is the general education category of M.)

Course Description
STA 2023 is an introductory course that assumes no prior knowledge of statistics but does assume some knowledge of high school algebra. Basic statistical concepts and methods are presented in a manner that emphasizes understanding the principles of data collection and analysis rather than theory. Much of the course will be devoted to discussions of how statistics is commonly used in the real world. There are two major parts to this course:

I Data - which includes graphical and numerical summaries to describe the distribution of a variable, or the relationship between two variables (chapters 1, 2 and 3, approximately 3 weeks), and data production to learn how to design good surveys and experiments, collect data from samples that are representative of the whole population, and avoid common sources of biases (chapter 4, 1 week.)

II Probability and Inference - using the language of probability and the properties of numerical summaries computed from a random samples (chapters 5, 6 and 7, 4 weeks), we learn to draw conclusions about the population of interest, based on our random sample, and attach a measure of reliability to them (chapters 8, 9, 10 approximately 8 weeks).

Course Objective
The primary goal of the course is to help students understand how the process of posing a question, collecting data relevant to that question, analyzing data, and interpreting data can help them find answers to real problems from their world.

General Education Objective (Mathematics)

Courses in mathematics provide instruction in computational strategies in fundamental mathematics including at least one of the following: solving equations and inequalities, logic, statistics, algebra, trigonometry, inductive and deductive reasoning. These courses include reasoning in abstract mathematical systems, formulating mathematical models and arguments, using mathematical models to solve problems and applying mathematical concepts effectively to real-world situations.

In this course, this objective will be met by ...

During the semester the students will be given an introduction to the three main aspects of statistics: design (of experiments/surveys), description (of data collected) and inference (the extension of conclusions from the data gathered in the sample to the larger population). These concepts will be presented through lectures three times a week and lab once a week. They will also learn about the normal and binomial distributions as well as the methodology of confidence intervals and significance tests. From the methods that they learn in class they will be able to critique real world surveys and experiments, interpret graphs in newspapers and magazines as well as conduct basic statistical inference for one or two groups.

General Education Student Learning Outcomes (SLOs)

Content: Students demonstrate competence in the terminology, concepts, methodologies and theories used within the discipline.

Communication: Students communicate knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to the discipline.

Critical Thinking: Students analyze information carefully and logically from multiple perspectives, using discipline specific methods and develop reasoned solutions to the problems.

In this course, these SLOs will be met by ...

Content: Students will learn critical terminology, concepts, methods, and theories during lecture. These concepts will include terminology to describe one and two samples, discuss surveys/experiments, basic probability theory, sampling distributions, and one and two group inference. The students will be assessed on these terms and concepts during the homework assignments, quizzes and the three exams. Students will also demonstrate their competence in identifying the appropriate formulas to use for each situation and using those formulas correctly.

Communication: The students will use verbal and written communication to discuss central statistical concepts in their lab assignments and semester project. These concepts include description of data sets, sampling methods and interpretations of inference methodology.

Critical Thinking: The students will be asked to critically think about trustworthiness of surveys and experiments presented in the media. Additionally, students will learn how to conduct

significance tests, a statistical method to logically determine if there is enough evidence for a hypothesis. Students will learn how to state the null and alternative hypotheses (different perspectives) and then to use the data collected to determine if there is enough evidence to support the alternative hypothesis using methods central to the field of statistics. The students will be tested on these concepts in their homework assignments, quizzes and on two of the exams.

Weeks	Topics Covered
1-2	Exploring Data with Graphs; Measures of Center, Spread and Position;
2-4	Exploring Relationships Between Two Variables Simple Linear Regression;
4-5	Experimental and Survey Design
6	Probability Rules
7-8	Binomial and Normal Distributions
9-10	Sampling Distributions of the Sample Mean and Sample Proportion
10-11	Confidence Interval for the Population Proportion and Population Mean;
12-13	Significance Test for the Population Proportion; Significance Test for the Population Mean
13-15	Comparing Two Ind. Means and Two Ind. Means; Comparing Means from Dependent Samples

Required Supplies:

- Textbook: *Statistics: The Art and Science of Learning From Data* by Agresti/F rankiin 3rd edition (used, new or online)
- Lab workbook by Mocko and Ripol 3rd edition
- Folder for additional course handouts.
- Scientific calculator (recommended)

My expectations of you:

- Arrive on time and review your notes after each class
- Ask questions if you do not understand something
- Make it your goal to understand everything that we do
- Inform the instructor of a problem in a timely manner

Grading Structure:

Assessments	% of Grade
3 Exams	66% (22% per exam)
Labs	9%
Homework	9%
Paper Quizzes	9%
Remote Points	7%

Grading Scale:

LETTER GRADE	POINTS	PERCENT OF POINTS
A	4.00	90.0-100%
A-	3.67	88.5 - 89.99%
B+	3.33	84.5 - 88.49%
B	3.00	80.0 - 84.49%
B-	2.67	78.5 - 79.9%
C+	2.33	74.5 - 78.49%
C	2.00	67.5 - 74.49%
D	1.00	60.0 - 67.49%
E	0.00	59.99 or below

Exams: There will be total of 3 exams. You will need to bring your calculator and a pencil. If a student is unable to take an exam at the scheduled time, they must get in touch with me one week prior to the exam for any arrangements to be made for a makeup. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite under such extenuating circumstances. In case of illness, the instructor must be notified on the day of the exam by 5pm and must receive a medical excuse. (There will also be a small portion of your exam grade that will be completed in the computer lab room on the day of the exam or for the last exam, the Thursday prior. More detail will be given in class.)

	Exam Dates
Exam 1	Thursday, Feb. 4th 6:15 to 10:15 pm
Exam 2	Thursday, Mar. 24th 6:15 to 10:15 pm
Exam 3	Wednesday, April 20th 6:15 to 10:15 pm

Labs: The labs will be conducted on Thursday of each week. There will be about 14 labs. Two of the lowest lab grades will be dropped.

R 4th period lab in Weil 408E
R 5th period lab in Weil 408E

Quizzes: There will be 11 in class paper quizzes usually based on the homework assignment due the previous Friday. The lowest 2 quiz grade will be dropped. Please see dates listed in Canvas. Quizzes should be made up as soon as possible. They cannot be made up after the Exam for that material has been covered.

Homework: Homework will be assigned on Friday and due the following Friday on most occasions. There will be 11 assignments. The highest 10 will be counted. Homework assignments will be accepted up to one week late for partial credit. Homework will not be accepted after 5pm one week after the due date. Copying another student's homework is

considered cheating and the minimal punishment will be to receive a grade of 0 on the assignment.

Remote Points: During 8 class periods, we will conduct clicker activities, the average score on the activities will be counted. The lowest two will be dropped. The activities can only be made up with documented excuse.

Course Policies

Academic Dishonesty: I adher to the University of Florida rules and guidelines for handling instances of academic dishonesty. Please refer to the Office of Students Services for detailed information about the current policies. **Instructor's Honor Code:** We the members of the University of Florida community pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

Attendance: Exams will be based on the assigned homework problems and the examples that are done in the class. If you miss class for any reason it is your responsibility to get any notes and information you might have missed from the uploaded notes on the calendar page in E-Learning. Additionally, you should turn your cellular phones off and refrain from eating, drinking, reading newspapers, doing homework for other classes, and excessive talking. Laptops should not be brought to class.

Getting Help:

- **Drop in for help during my office hours**
- **Before or after class**
- **One-on-one by appointment with teaching assistants by appointment**
- **One-on-one with instructor by appointment**

Grading: Grading will be changed only when an error has been made; negotiation is not appropriate. **There is no appeal process.**

Incomplete: Incomplètes are only assigned when extraordinary circumstances, arising after the date for dropping the course, prevent the student from completing the course requirements. Having a failing grade in the course is not a valid reason for requesting an Incomplete.

Accommodations for students with disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the students who must then provide this documentation to the Instructor when requesting accommodation.

Privacy Policies: Student records are confidential. Only information designated "UF directory information" may be released without your written consent. UF views each student as the primary contact for all communication. If your parents contact me about your grade, attendance or other information that is not "UF directory information". I will ask them to contact you.

Instructor Course/Evaluations: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conduced online at

https://evaluations.ufl.edu/. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results .