STA 3112 Statistics II

Section: U04

In Person

Fall Term 2023

Course Meeting Information

Classes are scheduled from 2:00 PM and 2:50 PM, Mondays, Wednesdays, and Fridays in Comp, Arts, Sci, & Educat 135.

Professor Information

Dane McGuckian

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Website: https://faculty.fiu.edu/~mcguckd/index.htm

Office Hours:

Mon, Wed, & Fri 1:00 - 1:50 in DM 406B or by appointment (note: I am available at more times than these, just ask). Please email me at least three hours in advance to let me know you are going to attend office hours to ensure I don't step out and miss you.

Course Prerequisites

Prerequisite: STA3111

Course Description and Purpose

This course is designed to provide undergraduate students with an introduction to some of the methods of statistical estimation and inference. It will also introduce the use of software to analyze data.

Course Goals

Statistics is widely used in business, government, and academia to make decisions based on quantitative reasoning. It gives the practitioner quantitative methods to estimate the value of, and to make inference about, important attributes of the population being considered. This course will lay the foundation for a more in-depth study of statistical methods, or simply provide the student with a basic understanding of how statistics is used to aid the decision process.

Student Learning Outcomes/Objectives

Students will be able to:

- Discuss the concepts of point estimate, interval estimate, and confidence coefficient/level.
- Define confidence intervals.
- Compute confidence intervals for a population mean μ based on both large and small samples.
- Define the “t” distribution and use the t table.
- Compute confidence intervals for a population proportion (the binomial parameter

p) using large samples.

- Determine the appropriate sample size.
- Discuss the elements of a test of hypothesis.
- Define Type I and Type II errors.
- Perform tests of hypotheses about μ based on both large and small samples.
- Perform tests of hypotheses about p using large samples.
- Discuss the concept of p-value (observed significance level of the test).
- Compute and interpret p-values.
- Form inferences based on two samples of data using: Estimation and Tests of Hypotheses.
- Estimate the value of, and test of hypotheses about μ1 - μ2 and p1 - p2 based on independent large samples.
- Estimate the value of, and test of hypotheses about μ1 - μ2 based on independent small samples
- Estimate the value of, and test of hypotheses about μD= μ1 - μ2 based on dependent (paired) samples.
- Perform Analysis of Variance (ANOVA) using data from a completely randomized design experiment.

- Perform Analysis of Variance (ANOVA) using data from a randomized block design experiment.
- Perform Analysis of Variance (ANOVA) using data from two factor factorial design experiments.
- Distinguish between one way and two-way analysis of variance (with and without interaction) models.
- Perform pairwise comparison of means for each design.
- Create and (use for estimation) a probabilistic regression model using the method of least squares with a single explanatory variable.
- Derive point estimates for the variance of the random error component, the slope, and y-intercept of the regression line.
- Find the correlation coefficient and the coefficient of determination for a set of ordered pairs.
- Interpret the the correlation coefficient and the coefficient of determination.
- Perform statistical inference procedures for the slope of the regression line.
- Estimate the mean value of Y at a given level of X using the least squares model.
- Predict and a new value of Y at a given level of X using the least squares model.
- Define the multinomial distribution.
- Perform the Chi-square goodness of fit test for one-dimensional count data.

- Discuss contingency tables for two categorical variables.
- Perform the chi-square test for independence.
- Discuss the ranking of data.
- Define non-parametric statistics.
- Perform the Wilcoxon Rank Sum Test.
- Perform the Wilcoxon Signed Rank Test.
- Perform the Kruskal-Wallis H-Test.
- Perfrom the Friedman's Fr-Test.
- Compare and contrast parametric and non-parametric statistics.

Expectations of the Course

I expect you to follow the four steps outlined below to succeed in this class.

Step 1: Review the in-class examples before starting your homework.

Step 2: Complete the homework on schedule.

Step 3: Get help on what you couldn't do in the homework.

Step 4: Review before the exam, do not cram!

Make-up Policy:

There are NO makeup exams, and everyone must take the final. If your final exam grade is higher than the lowest of your first four exam grades, I will double your final exam grade to replace the lowest test grade. If you have missed one exam the final will be

doubled to replace that missing grade. Therefore, if you have more than one emergency during the term that causes you to miss more than one exam you are encouraged to drop the course.

Attendance Policy:

To be successful in this course and in college you must be in class. Perfect attendance is recommended and missed work will result in a zero for the assignment. I do not take attendance, and you may come and go as you please as long as you are respectful to me and your fellow classmates in the process.

Assignments

HOMEWORK: Homework is not graded, nor is it collected. However, it must be completed to do well on the exams. You learn from doing the homework.

EXAMS: There will be **four exams and a cumulative final exam** (all equally weighted at 100 points). Exams are timed; late submissions will receive a zero. A missed exam will result in a zero for that exam. It is your responsibility to keep any returned examination papers if you believe a grade was misreported. Any needed correction to an exam grade must be made within two class meetings of the date the exam was returned.

EXAM DAYS: Everyone needs to have a calculator, pen, photo ID, and any needed formulas and tables from our website (I do not hand out tables and formula cards). The person sitting next to you should not have the same exam version that you have. I will drop a stack of pre-sorted exams at the end of each row. As you pass them down to the end of the row you will make sure your neighbor has a different exam version than yourself. You will bring your exam, scrap paper, answer sheet, and formula card to the front desk. It is important that you place your answer sheet in the pile with the first letter of your last name above it. The answer sheet should have no work on it—only answers. Do not erase your answer choices, if you wish to change an answer cross it out and write the new answer directly next to the crossed-out answer. Be prepared to show your ID when turning in your test.

Grading

GRADING: The sum of the points earned on your five exams will make up your overall grade. The scale will be based on the following point ranges:

Grading Scheme

Grade	Range	Grade	Range	Grade	Range
A	500 - 448	B	416 - 397	C	340 - 298
A-	447 - 432	B-	396 - 382	D	297 - 233
B+	431 - 417	C+	381 - 341	F	232 or less

Please note that I do not issue grades of incomplete unless you have documentation of an unforeseeable emergency that prevents you from taking the final exam and this emergency occurs after the drop deadline. It is your responsibility to withdraw yourself if you are not doing well in the course, or you must stay in the class and take whatever grade you earn.

Textbook and Course Materials for Purchase

If no materials listed, no items are needed.

No Textbook Required for purchase

Required/Recommended: No Textbook Required for purchase

Authors: No Textbook Required for purchase

Publisher: No Textbook Required for purchase

Publication Date: No Textbook Required for purchase

Copyright Date: No Textbook Required for purchase

ISBN 10: No Textbook Required for purchase

ISBN 13: No Textbook Required for purchase

Panther Book Pack Undergraduate Rental Program

FIU has implemented the Panther Book Pack rental program, which provides your required print and digital course materials at a flat rate of $20 per undergraduate credit

hour. When you registered for your classes this session, you were notified via email of the required course materials that are included in the Panther Book Pack. The Panther Book Pack program applies to all undergraduate credit hours per academic session. I recommend that you review the pricing for all materials across your classes this session compared to the Panther Book Pack flat rate. If the Panther Book Pack is not your best option, you may opt out up to three days after the add/drop deadline. You may opt back into the Panther Book Pack up to three days after the add/drop deadline. If you do not opt out of the Panther Book Pack rental program, you will be charged $20 per credit hour and the course materials will be reserved for you for the undergraduate courses for which you are registered. For more details, visit bookpack.fiu.edu

Other Course Materials and Open Educational Resources (OER)

I do not require a textbook for my course. Detailed notes and the homework for the course can be found here: Click STATS II

Additionally, most of my students use STATSprofessor.com for extra help. All of the content used in class can be found at STATSprofessor.

Course Communication

Communication in this course will take place via the Canvas Inbox.

Academic Integrity

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the University's educational mission. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be

subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Conduct and Honor Code.

Academic Misconduct includes:

Cheating

- The unauthorized use of any materials, information, study aids, or assistance from another person on any academic assignment or exercise unless explicitly authorized by the course Instructor;
- Assisting another student in the unauthorized use of any materials, information, or study aids, unless explicitly authorized by the Instructor; and
- Having a substitute complete any academic assignment or completing an academic assignment for someone else, either paid or unpaid;

Plagiarism

- The deliberate use and appropriation of another work without any indication of the source and the representation of such work as the Student's own.
- Assisting another student in the deliberate use and appropriation of another's work without any indication of the source and the representation of such work as the student's own.

Learn more about Student Conduct and Academic Integrity.

Panthers Care & Counseling and Psychological Services (CAPS)

If you are looking for help for yourself or a fellow classmate, Panthers Care encourages you to express any concerns you may come across as it relates to any personal behavior concerns or worries you have, for the classmate's well-being or yours; you are encouraged to share your concerns with FIU's Panthers Care website.

Counseling and Psychological Services (CAPS) offers free and confidential help for anxiety, depression, stress, and other concerns that life brings. Professional counselors are available for same-day appointments. Don’t wait to call (305) 348-2277 to set up a time to talk or visit the online self-help portal.

Course Awards

Affordability Counts: This course has been awarded the Affordability Counts Medallion. The Affordability Counts initiative at FIU seeks to make learning more affordable by reducing the cost of course materials to $60 or less. Find out more by visiting the Affordability Counts website at lowcost.fiu.edu.