STA 2023 **DETAILED COURSE SYLLABUS** **2022-2023**

FACULTY COURSE INFORMATION SHEET

STATISTICS

COURSE: STA 2023 Statistics, 3 hours lecture, and 3 credits. CRN 14861

MAXIMUM NUMBER OF STUDENTS: 33

NAME OF COURSE MANAGER: Hadley Pridgen

TELEPHONE NUMBER OF COURSE MANAGER: 769-1551 (ext. 3445)

OFFICE LOCATION: SUW 256

E-MAIL ADDRESS: hpridgen@gulfcoast.edu

MATH DIVISION FAX NUMBER: 767-8252

PREREQUISITE FOR THE COURSE:
Math placement test score (PERT: 114-122 (or) Accuplacer Algebra: 72-87 (or) SAT Math: 24.0 (or) ACT Math: 19) or minimum grade of "C" in MAT 0012 or Flexible Placement

TYPE OF STUDENT:
The course is designed for general education students.

This statistics course is NOT meant for students who wish to major in psychology at Florida State University (FSU). If a student wishes to enter the psychology program at FSU, they should enroll in STA2122 instead. Other majors at FSU may also require STA2122 over STA2023 so students should check with the transferring institution.

FORMULAS OR TABLES GIVEN TO THE STUDENT FOR EXAM PURPOSES:
Tables of probabilities in the book and the formulas and tables insert from the text.

USE OF CALCULATORS:
Calculators are permitted. A TI-83/84 family calculator is recommended and will be used by the instructor.

METHODS OF INSTRUCTION:
The course is conducted by the lecture-question-demonstration laboratory method. At the beginning of the class, questions are encouraged and answered fully over the previous lecture and problem assignment. The instructor then lectures from current material from the text or presents new material in the computer lab when available.

Proofs and demonstrations of methods are presented thoroughly when not beyond the scope of the course and the background of the students. Selected problems are worked at the board demonstrating the area of work. A short summary is given and a problem assignment is made. Small group activity is encouraged.

Unit tests and the final exam are announced in advance through the daily schedule. At the discretion of the instructor in class quizzes or take-home assignments may be given to the student for grading purposes. Unit tests are returned in a timely manner and any of the problems requested are fully explained. Problems frequently missed are reviewed whether requested or not. The final exam **is not** returned.

NATURE OF THE TESTS:
There will be **no** take home unit tests/final exam. Unit tests will include problem solving and multiple-choice questions. No more than 25% of the test may consist of multiple choice questions. Unit tests will include concepts from previous unit tests given that semester. A minimum of four (4) unit tests must be given. Each instructor is responsible for making out his/her

own unit tests. Unit tests must be typed and should be of sufficient length so that they are completed during the testing period. Unit test from past semesters should not be used. Do not return tests in order to redo/complete—just for future study. Do not use a review sheet or study guide in the same format as the unit test being given.

Students should be encouraged to use their unit tests when preparing for the final exam. There are **no exemptions** from the final exam. The final exam will be comprehensive and should be constructed so that the student can complete it in two hours or less. The score on the final exam may be used to replace the lowest unit test or the first missed unit test. The final exams for day classes are given according to the college exam schedule. The final exam for classes meeting after 4:00 p.m. should be given during the regular class meeting time and at the regular meeting place during the final exam week. Specific course objectives will be used to construct questions on the final exam and the final exam will be common among all sections taught during that semester.

The course manager will provide a copy of his/her unit tests and/or final examinations to other instructors upon their request. A copy of all final exams shall be sent to the course manager or the division secretary for filing.

Students will not be allowed to leave a testing situation and come back at a later time to finish the test. Students will not be allowed to "retake" a unit test, midterm, or final exam.

BASIS FOR GRADING:
The students are expected to become familiar with the notations of statistics and to achieve competence in the fundamental skills. The degree to which these objectives are achieved is measured and the final course grade determined by the testing system.

The final exam covers the entire course and counts for approximately 25% of the course grade. There are at least four (4) unit tests, which are announced in advance. An appropriate number of "pop-quizzes/take home assignments" may be given throughout the course at the discretion of the instructor. The average of these quizzes will count as one additional unit test. Therefore, the number of grades counted as a unit test may be four or five (4/5). The college catalog will be used to convert the numerical average to a letter grade. The college grading scale is: A (100-90), B (89-80), C (79-70), D (69-60), and F (59-0)

COMMENTS ABOUT THE COURSE:
The basic theory is developed with a view toward giving the student a sound understanding of statistical terms and processes and an appreciation of some of its many uses. The course must be passed with a grade of "C" if it is to be counted as part of the 6 hour Gordon Rule requirement.

HELP AVAILABLE OUTSIDE OF THE CLASSROOM:

a. Instructor
Full time faculty have posted ten (10) hours per week on their schedule. Their offices are located in the Student Union West on the 2nd floor (SUW). Adjunct faculty are available for assistance 30 minutes before or after class. Students having difficulty are strongly encouraged to see the instructor for additional help.

b. Specific Course Objectives
Specific Course Objectives are available upon request. These objectives are posted on the Mathematics' Web Site.

3. Course Videos
Course videos are available via Canvas from your instructor.

4. Math Lab
The Math Lab is available in room SUW 260 and 261 for tutoring during the week (see door for hours).

STUDENT LEARNING OUTCOMES
STATISTICS

1. Students will learn and understand the definitions of statistical terms.

2. Students will be able to read and interpret and construct statistical graphs of various kinds.

3. Students will be able to understand and apply the principles of probability to given situations.

4. Students will recognize and understand different types of discrete random variables.

5. Students will recognize and understand continuous random variables.

6. Students will understand the results of the central limit theorem and be able to apply those concepts/results to real-world situations.

7. Student will understand the concept of confidence intervals and the underlying theory.

8. Students will understand the components of a hypothesis test.

9. Students will understand and compute the components of linear correlation and linear regression.

10. Students will recognize and understand two population situations and be able to perform appropriate hypothesis tests.

11. Students will be able to perform non-parametric tests for small sample, non-normal distributions.

SPECIFIC COURSE OBJECTIVES
STATISTICS

1.1 An Overview of Statistics

a. The definition of statistics.
b. Distinguish between a population and a sample.
c. Distinguish between a parameter and a statistic.
d. Distinguish between descriptive and inferential statistics.

1.2 Data Classification

a. Distinguish between qualitative and quantitative data.
b. Classify data as nominal, ordinal, interval, and ratio.

1.3 Data Collection and Experimental Design

a. Design a statistical study.
b. Collect data by doing an observational study, performing an experiment, using a simulation, or using a survey.
c. Design an experiment.
d. Create a sample.

2.1 Frequency Distributions and Their Graphs

a. Construct a frequency distribution.
b. Construct a frequency histogram.

2.2 More Graphs and Displays

a. Graph and interpret quantitative data.
b. Graph and interpret qualitative data.

2.3 Measures of Central Tendency

a. Find the mean, median, and mode.
b. Describe the shape of a distribution.

2.4 Measures of Variation

a. Find the range, standard deviation, and variance.
b. Use the Empirical Rule.
c. Use Chebychev's Theorem.
d. Approximate the sample standard deviation.

2.5 Measures of Position

a. Find the first, second, and third quartiles as well as the interquartile range of a data set.
b. Determine outliers.
c. Construct box plots.
d. Interpret percentiles.
e. Find and interpret z-scores.

SPECIFIC COURSE OBJECTIVES
STATISTICS

3. 1 Basic Concepts of Probability and Counting

a. Identify sample space and simple events.
b. Use the Fundamental Counting Principle to find number of events.
c. Distinguish between classical, empirical, and subjective probability.
d. Find the probability of a complement of an event.
e. Use a tree diagram to find probability.

3.2 Conditional Probability and the Multiplication Rule

a. Find the probability of an event, given another event has occurred.
b. Distinguish between independent and dependent events.
c. Use the Multiplication Rule to find the probability of a sequence of events.
d. Use the Multiplication Rule to find the probability of a conditional event.

3.3 The Addition Rule

a. Determine if events are mutually exclusive.
b. Use the Addition Rule to find the probability of two events.

4.1 Probability Distributions

a. Distinguish between continuous and discrete random variables.
b. Construct a discrete probability distribution.
c. Determine if a probability distribution is valid.
d. Find the mean, variance, and standard deviation of a discrete probability distribution.
e. Find the expected value of a discrete probability distribution.

4.2 Binomial Distributions

a. Determine if a probability experiment is a binomial experiment.
b. Find binomial probabilities.
c. Find the mean, variance and standard deviation of a binomial probability distribution.

5.1 Introduction to Normal Distributions and the Standard Normal Distribution

a. Interpret normal distribution graphs.
b. Find areas under the standard normal curve.

5.2 Normal Distributions: Finding Probability

a. Find probabilities associated with normal distributions.

5.3 Normal Distributions: Finding Values

a. Find values associated with normal distributions.
b. Transform z-scores to x values.

5.4 Sampling Distributions and the Central Limit Theorem

a. Find and verify sampling distributions.
b. Interpret the Central Limit Theorem.
c. Find probabilities using the Central Limit Theorem.

SPECIFIC COURSE OBJECTIVES
STATISTICS

6.1 Confidence Intervals for the Mean (σ Known)

a. Find a point estimate and margin of error.
b. Construct and interpret confidence intervals when σ is known.
c. Determine minimum sample size needed for a given margin of error.

6.2 Confidence Intervals for the Mean (σ Unknown)

a. Interpret the t-distribution.
b. Construct and interpret confidence intervals when σ is unknown.

6.3 Confidence Intervals for Population Proportions

a. Find a point estimate and margin of error.
b. Construct and interpret confidence intervals.
c. Determine minimum sample size needed for a given margin of error.

7.1 Introduction to Hypothesis Testing

a. State null and alternative hypotheses.
b. Identify Type I and II errors.
c. Identify one and two tailed tests.
d. Interpret a decision based on statistical test results.

7.2 Hypothesis Testing for the Mean (σ Known)

a. Find p-values.
b. Find critical values.
c. Perform z-tests for the mean.
d. Determine whether to reject or fail to reject a hypothesis.

7.3 Hypothesis Testing for the Mean (σ Unknown)

a. Find critical values on the t-distribution.
b. Perform t-tests for the mean.
c. Determine whether to reject or fail to reject a hypothesis.

7.4 Hypothesis Testing for Proportions

a. Perform z-tests for the proportion.
b. Determine whether to reject or fail to reject a hypothesis.

8.1 Testing the Difference Between Means (Independent Samples with σ_1 and σ_2 Known)

a. Determine if samples are independent or dependent.
b. Perform two sample z-tests for the difference between means.

8.2 Testing the Difference Between Means (Independent Samples with σ_1 and σ_2 Unknown)

a. Perform two sample t-tests for the difference between means.

8.3 Testing the Difference Between Means (Dependent Samples)

a. Perform t-tests on difference of paired data.

8.4 Testing the Differences Between Proportions

a. Perform two sample z-tests for the difference between proportions.

9.1 Correlation

a. Construct a scatterplot.
b. Find a correlation coefficient.

9.2 Linear Regressions

a. Find the equation of a regression line.
b. Use regression line to predict values.

11.1 The Sign Test

a. Use sign test to test claims about a population median.

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STATISTICS

I. COURSE DESCRIPTION:

STA 2023: Statistics, 3 hours lecture, and 3 credits.

Prerequisite: Math placement test score (PERT: 114-122 (or) Accuplacer Algebra: 72-87 (or) SAT Math: 24.0 (or) ACT Math: 19) or minimum grade of "C" in MAT 0012 or Flexible Placement

An introductory course which includes: summarization of data, probability, probability distributions, normal distribution, sample mean and standard deviation, statistical estimation, testing hypotheses, linear correlation and regression, and non-parametric statistics.

II. TEXT: Elementary Statistics, Larson, 7th edition, 2019, Pearson.

OTHER MATERIALS: A calculator (TI-83, TI-84 etc.) is required in the course. Students may be expected to use computers in the computer lab for the completion of projects.

III. GENERAL COURSE OBJECTIVES:

The student should:

1. gain knowledge in the topics considered by the state to comprise STA 2023 (elementary statistics)
2. be aware of the capabilities and limitations of statistical methods
3. acquire knowledge to prepare for more advanced courses in statistics
4. acquire skill necessary to apply these methods to real world applications

IV. COURSE OUTLINE: See the attached daily schedule for a detailed outline.

V. ATTENDANCE-WITHDRAWAL-GRADE FORGIVENESS-ATTEMPTS:

A. Attendance Policy:

Attendance in class is vital to your success and is positively correlated with your final grade. Furthermore, attendance with participation is even more highly correlated with your final grade. Please ensure that you are present and participating at each class session. Attendance will be recorded each day and you are expected to attend. If you do not attend class for the first two weeks, you will be withdrawn for non-attendance. Absences of more than one-eighth the course (ie, at four absences in a standard 16 week two class per week semester) may result in withdrawal. **YOU MUST ATTEND ON EACH TEST OR EXAM DAY.**

B. Withdrawal Policy:

Two withdrawals are permitted per course. After that, a grade will be assigned. Please be concerned about withdrawals. When admitting students into certain programs, universities may calculate withdrawals as grades. There are two kinds of withdrawals-student and administrative.

1. Student Withdrawal: Students may withdraw from a course prior to the scheduled withdrawal deadline published in the college catalog. Students must log onto Lighthouse, go to the student tab, select Admissions Forms, then select Student Withdrawal Form, before the deadline.

2. Administrative Withdrawal: This withdrawal is completed by an instructor for excess absences. Withdrawals initiated prior to the published withdrawal deadline will be recorded as "W". After the withdrawal deadline, a student cannot be withdrawn from the course and will receive a grade.

C. Grade Forgiveness:

A student may repeat a course when a grade of "D" or "F" has been earned. The last grade counts. However, universities may count forgiven grades in calculating the grade point average. Forgiven grades may also be calculated in determining financial aid eligibility.

D. Attempts:
This course, which is a college credit course, may be attempted three times. On the third attempt, 100% of the full cost of instruction will be charged. Students with major extenuating circumstances may submit a letter of appeal stating the circumstances to the Counseling Center. All grades from the third and subsequent attempts will be calculated in the grade point average.

VI. HOMEWORK:
Homework will be assigned daily. The daily completion of all homework is essential for learning the material in the course and as preparation for the examinations.

VII. TESTING:
There will be four unit tests given. The unit tests will be announced in advance, will count equally, and will be returned. The final exam is comprehensive and **will not** be returned. There are **no exemptions** from the final exam. At the option of the instructor unannounced "pop-quizzes" and/or outside computer assignments may be given. The average of these assignments should count no more than one unit test. Therefore, the number of grades counted as a unit test will be four or five (4 or 5). The student is expected to keep up daily with the assigned work.

Students will not be allowed to leave a testing situation and come back at a later time to finish the test. Students will not be allowed to "retake" a unit test, midterm, or final exam.

VIII. GRADING:
A comprehensive final exam (no exemptions) will count 25% of your grade. The college catalog will be used to convert the numerical average to a letter grade. The college grading scale is: A (100-90), B (89-80), C (79-70), D (69-60), and F (59-0)

IX. MAKE UP WORK:
No daily quizzes will be made up. If you miss a unit test and you have a valid excuse, your final exam grade may count as the first missing unit test grade. If you miss more than one unit test, you may take a make up test at the discretion of the instructor. If you have not missed any unit tests, the final exam grade, may be used to replace the lowest unit test grade.

X. ACCESSBILITY STATEMENT:
Gulf Coast State College supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, reasonable accommodations can be arranged. Prior to receiving accommodations, you must register with Student Accessibility Services. Appropriate academic accommodations will be determined based on the documented needs of the student. For information regarding the registration process, email sar@gulfcoast.edu or call 850-747-3243.

XI. TRIO:
TRIO Student Support Services (SSS) is a federally funded grant program which serves first generation students (neither parent has a 4-year bachelor degree), low-income students, and/or students with disabilities achieve their academic goals. Student success is at the center of everything we do in our program. We offer academic advising, 24/7 online tutoring in most subjects, textbook and computer/technology loans, transfer and cultural trips, assistance with financial aid applications and scholarships, career exploration and a dedicated computer lab and study area. All services are FREE to SSS program participants. Visit https://www.gulfcoast.edu/current-students/trio/ to apply online or call (850) 913-2937 for more information. SSS is located in Student Union West rm89.

XII. AVAILABLE HELP:

Studying requires discipline, tenacity, and hard work. View this course as a job. Attendance is absolutely necessary, as well as attentiveness to detail and alertness. You must earn a "C" in this course in order to receive credit.

1. **Your Instructor**
   Full time faculty have posted ten (10) hours per week on their schedule. Their offices are located in the Student Union West on the 2nd floor (SUW). Adjunct faculty are available for assistance 30 minutes before or after class. Students having difficulty are strongly encouraged to see the instructor for additional help.
2. **Specific Course Objectives**
   Specific Course Objectives are available upon request. These objectives are posted on the Mathematics' Web Site. Ask your instructor how to obtain a copy.
3. **Course Videos**
   Course videos are available via Canvas from your instructor.
4. **Math Lab**
   The Math Lab is available in room SUW 260 and 261 for tutoring during the week (see door for hours).

XIII. PAPER CUT:

The PaperCut print management client is installed in all computer labs. The PaperCut user web console is accessed through the MyGCSC portal. The logon is the first part of your student email address, everything before the @mygulfcoast.edu. Students will be required to add money to their PaperCut accounts before they are able to print. Money can be added to student print accounts by cash, credit, or debit card. Cash is accepted at PaperCut kiosks located in the Library. Credit and debit card payments, minimum $5.00, can be made through the "add credit" tab on the PaperCut user web console. Instructions for the use of PaperCut are located at https://www.gulfcoast.edu/administration-departments/information-technology-services/printing/

VI. HB 233:

In accordance with federal and state privacy laws, students may record class lectures for their own personal educational use, in connection with a complaint to the college, or as evidence in internal or external legal proceedings. Students may not publish or upload the recordings or any components thereof without the knowledge and written permission of the faculty member. Failure to obtain permission to publish could lead to the students' having to pay damages, attorney fees, and court costs. For more information about what can be recorded, please see the guidelines on pages 36-38 in the GCSC Student https://www.gulfcoast.edu/current-students/student-handbooks/2022-2023-student-handbook.pdf.

VII. DIVISION POLICIES REGARDING COVID-19 (effective Fall 2022):

1. The health and safety of students and faculty are a priority. Students and faculty should practice social distancing when possible.
2. If you are sick, please stay home to protect others. Notify your professor of your condition by phone or email.
3. If you test positive, stay home for 5 days and please inform your instructor(s) to make plans for course requirements to be met. Also inform David Thomasee, GCSC Executive Director of Operations, at 850-873-3582. (Email: dthomasee@gulfcoast.edu) You will receive added instructions at that time. Confidentiality will be kept.
4. This information is subject to change. The most up-to-date information regarding Covid-19 should be available at https://www.gulfcoast.edu/covid-19-coronavirus.html.

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STUDENT COURSE INFORMATION SHEET

STATISTICS

CLASSROOM CONDUCT POLICY

In order to promote a learning environment, in which you as a student may receive the greatest consideration, we will do all we can to prevent unnecessary interruptions and class disruptions. To this end, it is the stated policy of the Division of Mathematics that disruptions, absolutely and unequivocally, will not be tolerated in the classrooms administered by this division. To this end, we remind you that the **instructors are obligated** to adhere strictly to the following policies:

1. Everyone is required to be in class on time.
   Anyone entering the classroom after the instructor has begun class is late and is a disruption to the class. The instructor must implement an appropriate policy to discourage late arrivals.

2. Disciplinary action in the case of cheating will be administered in accordance with college policy. Do not cheat. As stated in the college course catalog, "Honest participation in academic endeavors fosters an environment in which optimal learning can take place and is consistent with the college's mission. Academic misconduct, including cheating and plagiarism, is destructive to the spirit of an education environment and therefore cannot be condoned. See the Student Handbook for details on this policy.

   The Student Handbook defines cheating to include, but not be limited to, unauthorized assistance in taking quizzes, tests, or examinations; dependence upon the aid of sources beyond those authorized by the instructor; the acquisition without permission of tests or other academic material belonging to (another student) or a member of the College's faculty. In the case of this course, cheating will result in you receiving a grade of F.

3. The student must have prior consent of the instructor before leaving the class early.
   If you must leave class early, notify the instructor before the beginning of class. We do not conduct "open" classrooms where individuals may arrive and exit at their discretion. This activity is disruptive to those trying to learn and will not be allowed. If you leave early without prior notification to the instructor, you will not be allowed back in the classroom without first obtaining permission from Mrs. Reynolds, Division of Mathematics Chair.

4. The instructor is not to allow talking or other distractions to occur at inappropriate times. **Use of electronic communication devices** (including, but not limited to, cell phones, Ipods, PDA's, MP3/Music players, Blackberries, etc) are allowed in the classroom only at the discretion of the instructor and must be used only as they directly relate to the class. Talking or other disruptive behavior (including ringing cell phones) are distractions to other students and have no place in a college environment. Students who engage in such behavior will be asked to stop. If the behavior continues, the student(s) will be asked to leave and confer with Mrs. Reynolds, Division of Mathematics Chair, concerning the nature of the behavior before being allowed back in the classroom. **NO** electronic devices will be allowed in the classroom on test days with the exception of an approved calculator.

5. **No food or drink** is allowed in the classroom.

6. Infractions of discipline may be handled by the instructor as final authority.
   The student has a right to appeal.