

MATH 0813S - JUST IN TIME SUPPORT FOR ELEMENTARY STATISTICS

Catalog Description

Corequisite: Concurrent enrollment in MATH 13

Hours: 36 lecture

Description: Just in time support option covering the core prerequisite skills, competencies, and concepts for Elementary Statistics. Intended for students who are concurrently enrolled in MATH 13. Topics include concepts from arithmetic, pre-algebra, elementary and intermediate algebra, and descriptive statistics that are needed to understand the basics of college-level statistics. Concepts are taught through the context of descriptive data analysis including an introduction to technologies such as Desmos, Excel, Statcrunch, Minitab, SPSS or graphing calculators. Recommended for students taking MATH 13 with little or no recent algebra knowledge. (pass/no pass grading) (noncredit)

Course Student Learning Outcomes

- CSLO #1: Execute relevant statistical procedures and interpret the results in the context of the data or scenario. (PSLO A, C & D)
- CSLO #2: Demonstrate relevant arithmetic and algebraic skills and interpret results in the context of the data or scenario. (PSLO A & D)
- CSLO #3: Approximate areas under curves (histograms), use technology and geometric reasoning to find area, and interpret these areas as proportions. (PSLO A, C & D)
- CSLO #4: Explain statistical thinking and concepts related to statistical inference using hands-on demonstrations, simulations or applets. (PSLO A, C & D)
- CSLO #5: Construct, use, and interpret mathematical models, specifically linear functions to represent and communicate relationships in quantitative data. (PSLO A, C & D)

Effective Term

Fall 2019

Course Type

Support course – Noncredit

Contact Hours

36

Outside of Class Hours

72

Total Student Learning Hours

108

Course Objectives

Students will be able to:

1. Read and interpret word problems by thinking critically in a variety of statistical concepts.

2. Analyze given information and develop strategies for solving problems involving statistical and logical reasoning.
3. Graphically represent qualitative and quantitative data.
4. Compare data sets using numerical measures and appropriate graphical representations and communicate findings in the context of the data.
5. Round numbers to the appropriate decimal place and utilize scientific notation.
6. Recognize and fluently use equivalent forms of fractions, decimals, and percentages.
7. Understand and interpret summation notation.
8. Understand and interpret inequalities.
9. Apply, interpret and explain the basics of probability.
10. Identify, compare and explain the contextual meaning of fractions.
11. Identify variables in descriptive statistics.
12. Understand the relationship between the area under the curve (histograms) and the representative proportion.
13. Find, graph and interpret linear model and slopes.
14. Solve linear equations.
15. Use the order of operations to evaluate statistical formulas.
16. Describe and interpret statistical measures (e.g., mean, variance, standard deviation, correlation coefficient).
17. Demonstrate fluency with statistical terminology and notation through written and oral presentation.
18. Implement student-specific learning strategies and study techniques.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- Not Transferable

Methods of Evaluation

- Classroom Discussions
 - Example: Students will be evaluated on their arithmetic and reasoning skills. As a class, the instructor will hand every student a quarter and ask each student to flip his/her coin 5 times. Each student will record the number of heads they obtain out of 5 flips. For example, John gets 3 heads out of 5 flips. The instructor will collect the data by asking students to raise their hands if they get 0 heads, 1 head, 2 heads, 3 heads, 4 heads, and 5 heads. The data is shared on the board. The instructor starts the discussion by asking the following questions: a) How many heads do you expect to get when you flip a coin 5 times? b) How many heads did you actually obtain from flipping your coin? Why is there a difference between what you expect and what you obtain from your experiment? c) Why do some students get 0 heads, some get 1 head, some get 2 heads etc? d) Find the proportion of heads obtain from 5 flips. e) As a class, find the total number of heads obtained from all students and the total number of flips. For example, there were 68 heads obtained out of 150 flips (30 students) f) Find the proportion of heads obtained from the total number of flips. Compare this answer with the answer from d).
- Objective Examinations
 - Example: A soft drink dispenser can be adjusted to deliver any fixed number of ounces of soft drink. If the machine is operating with a standard deviation in delivery equal to 0.3 ounces, what

should be the mean setting so that a 12-ounce cup will overflow less than 1% of the time? Assume a normal distribution for ounces delivered. (A) 11.23 ounces (B) 11.30 ounces (C) 11.70 ounces (D) 12.70 ounces (E) 12.77 ounces

- Problem Solving Examinations
 - Example: To assess student's understanding of certain course objectives the following problem could be placed on an examination. The instructor will evaluate the accuracy and quality of the student's solution. The principal at Tahoe Elementary School randomly selected three of the school's twelve classes of students to participate in an opinion poll. All of the children in each of the three randomly selected classes were asked the question "What is your favorite fruit to eat?". The following results were obtained. Apple, Grapes, Apple, Apple, Banana, Apple, Apple, Grapes, Orange, Apple, Apple, Banana, Strawberries, Apple, Apple, Grapes, Apple, Orange, Apple, Apple, Apple, Apple, Grapes, Grapes, Apple, Orange, Apple, Apple, Banana, Apple, Apple, Apple, Strawberries, Apple, Orange, Grapes, Grapes, Apple, Grapes, Grapes, Grapes, Banana, Grapes, Banana, Apple, Banana, Grapes, Apple, Banana, Strawberries, Banana, Apple, Orange, Grapes, Orange, Grapes, Apple, Orange. Construct a percentage distribution table for this data and describe your results.

Repeatable

No

Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Using an interactive lecture format, the instructor will develop the measures of central of tendency and variation. To motivate the concept and start the discussion, the instructor can have the students count the number of raisins in 17 boxes. Create a method of displaying the number of raisins in each box. At this time the instructor can take the time for "just in time remediation" and spend time discussing the number of ways we can express the number of raisins in a box. Course Objectives Addressed: 3) Graphically represent qualitative and quantitative data 16) Describe and interpret statistical measures (e.g., mean, variance, standard deviation, correlation coefficient). Collaborative Learning: Using an in-class small group collaborative learning activity, students were assigned the task to estimate the mean lower leg length of adults by collecting their own data. Student first have to determine what is meant by lower leg length. They discuss the discrepancies that can occur while collecting data if different definitions and units are used for lower leg length of adults. The instructor prompts the groups by asking how they determined the lower leg length. The instructor guides them in using the appropriate conversion factor to make sure the data is uniform. The instructor has them report to the class. Course Objectives Addressed: 1) Read and interpret word problems by thinking critically in a variety of statistical concepts 2) Analyze given information and develop strategies for solving problems involving statistical and logical reasoning 11) Identify variables in descriptive statistics

Distance Learning

1. Assign students to groups using the "People" feature of LMS labeling the "Group Set" name with the "group" feature allows students to have discussion with only members of their group. The assignment can be graded as a group. Title of the Lesson Plan/Activity. Each will student will count the number of raisins in their box. A discussion question will be posted on why the size of the box of raisins makes a difference. Using the "survey" form on LMS (quiz feature – with one click to change to a feature) Your name, group name and # raisins, brand of raisins, size of the box. Be cautious that the survey will be graded because it is part of the quiz feature though not included in the gradebook). The instructor will do a conference with the all students showing the collected data which can be recorded (for those not able to attend) and made available for 14 days and discussing the different brands, the validity of the same size box, and the number of raisins and the average, range and variability. Students will submit a group summary prompted by questions given by the instructor. The instructor can create an assignment which can be assigned to "Group" and determine the "submission" as online. Course Objectives Addressed: 3) Graphically represent qualitative and quantitative data 16) Describe and interpret statistical measures (e.g., mean, variance, standard deviation, correlation coefficient).

Typical Out of Class Assignments Reading Assignments

1. Read an article about private schools and charter schools versus public schools to discuss the possible discrepancies of the data. 2. Read an article about South African mathematician John Kerrich, who carried out a famous study as a prisoner of war in World War II, to explain the idea of the long-run proportion.

Writing, Problem Solving or Performance

1. A student answered 72 out of 100 questions correctly on the first try. What proportion of the questions were answered correctly on the first try? (Represent your answer as a fraction, decimal and percent.) 2. Describe a sample space for each of the following experiments. a) The toss of a coin b) The roll of a die

Other (Term projects, research papers, portfolios, etc.) Required Materials

- Elementary Statistics
 - Author: Navidi & Monk
 - Publisher: McGraw Hill
 - Publication Date: 2018
 - Text Edition: 3rd
 - Classic Textbook?: No
 - OER Link:
 - OER:
- Introductory Statistics
 - Author: Illowsky & Dean
 - Publisher: OpenSTAX
 - Publication Date: 2016
 - Text Edition: 1st
 - Classic Textbook?: No
 - OER Link:
 - OER:

- Elementary Statistics
 - Author: Triola
 - Publisher: Pearson
 - Publication Date: 2018
 - Text Edition: 13th
 - Classic Textbook?: No
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.