



COURSE OUTLINE OF RECORD

Number: MATH G160S

TITLE: Introduction to Statistics with Support

ORIGINATOR: Lindsay Lewis

EFF TERM: Fall 2023

FORMERLY KNOWN AS:

DATE OF

OUTLINE/REVIEW: 05-03-2022

CROSS LISTED COURSE:

TOP NO: 1701.00

CID: MATH 110

SEMESTER UNITS: 6.0

HRS LEC: 108.0

HRS LAB: 0.0

HRS OTHER: 0.0

CONTACT HRS TOTAL: 108.0

STUDY NON-CONTACT HRS RECOMMENDED: 216.0

TOTAL STUDENT LEARNING HRS: 324.0

CATALOG DESCRIPTION:

This course includes concepts and procedures of descriptive and inferential statistics; collecting, classifying, tabulating, graphing univariate and bivariate data; measures of central tendencies, variation, percentiles, probability, binomial, normal, T, Chi-square, and F distributions; making inferences, decisions and predictions. This course develops statistical thinking through the study of and applications to data sets in the social and behavioral sciences, business, and other disciplines. In addition to this statistics content, the course provides supplemental instruction in basic algebra skills and concepts needed for success in statistics computations and applications. The use of a graphing calculator and/or statistical analysis computer programs is integrated into the course.

JUSTIFICATION FOR COURSE:

PREREQUISITES:

- Course taught at the level of intermediate algebra or appropriate math placement.

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:

Mathematics

MATERIAL FEE: Yes ☐ No ☒ Amount: \$0.00

CREDIT STATUS: Noncredit ☐ Credit - Degree Applicable ☒ Credit - Not Degree Applicable ☐

GRADING POLICY: Pass/No Pass ☐ Standard Letter ☒ Not Graded ☐ Satisfactory Progress ☐
P/NP/SP Noncredit ☐ Letter Noncredit ☐

OPEN ENTRY/OPEN EXIT: Yes ☐ No ☒

TRANSFER STATUS: CSU Transferable ☐ UC/CSU Transferable ☒ Not Transferable ☐

BASIC SKILLS STATUS: Yes ☐ No ☒

LEVELS BELOW TRANSFER: Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No ☒ Yes ☐ **NUMBER REPEATS:**

CB25 GENERAL EDUCATION STATUS: B = CSU B4, UC IGETC 2 OR GE Math/Quant Reason w/ 4-year

CB26 SUPPORT COURSE STATUS: S = Support course

REQUIRED FOR DEGREE OR CERTIFICATE: No [] Yes [X]

Business Administration 2.0(Associate in Science for Transfer)

Administration of Justice (Associate in Science for Transfer)

Anthropology (Associate in Arts for Transfer)

Business Administration (Associate in Arts)

Child and Adolescent Development for Transfer (Associate in Arts for Transfer)

Elementary Teacher Education (Associate in Arts for Transfer)

Kinesiology (Associate in Arts for Transfer)

Law, Public Policy, and Society (Associate in Arts for Transfer)

Political Science (Associate in Arts)

Political Science (Associate in Arts for Transfer)

Pre-Occupational Therapy (Certificate of Achievement)

Pre-Physician Assistant (Certificate of Achievement)

Public Health Science (Associate in Science for Transfer)

Social Justice Studies (Associate in Arts for Transfer)

Sociology (Associate in Arts for Transfer)

GE AND TRANSFER REQUIREMENTS MET:

COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Summarize data through the use of graphs, calculate measures of central tendency and dispersion, and describe the distribution.
2. Compute the probability of an event involving a normally distributed random variable.
3. Compute probabilities using probability rules, counting techniques, and probability distributions, including sampling distributions.

COURSE OBJECTIVES:

1. Address the affective side of learning to provide students with the necessary skills to succeed in transfer-level mathematics.
2. Perform basic operations of real numbers.
3. Interpret percentages, ratios, and proportions.
4. Develop skills necessary for success at solving word problems.
5. Distinguish among different scales of measurement and their implications.
6. Interpret data displayed in tables and graphically.
7. Apply concepts of sample space and probability.
8. Calculate measures of central tendency and variation for a given data set.
9. Identify the standard methods of obtaining data and identify the advantages and disadvantages of each.
10. Calculate the mean and variance of a discrete distribution.
11. Calculate probabilities using normal and t-distributions.
12. Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem.
13. Construct and interpret confidence intervals.
14. Determine and interpret levels of statistical significance including p-values.
15. Interpret the output of a technology-based statistical analysis.
16. Identify the basic concept of hypothesis testing including Type I and Type II errors.
17. Formulate hypothesis tests involving samples from one and two populations.
18. Select the appropriate technique for testing a hypothesis, and interpret the result.

19. Using linear regression and ANOVA analysis for estimate and inference, and interpret the associated statistics.

20. Use appropriate statistical techniques to analyze and interpret applications based on data from disciplines including business, social sciences, psychology, life science, health science, and education.

COURSE CONTENT:

LECTURE CONTENT:

A. Skills for Success

1. Learning Skills
 - a. Study skills
 - b. Test-taking skills
2. Operations of Real and Complex Numbers
 - a. Arithmetic
 - b. Simplifying
 - c. Rounding
 - d. Scientific notation
 - e. Summation notation
 - f. Sets and intervals
3. Ratios and Proportions
 - a. Ratios as fractions
 - b. Decimals and fractions as percents
 - c. Solving problems using proportions
4. Linear Equations
 - a. Interpret the slope
 - b. Interpret the vertical intercept
5. Solving Word Problems
 - a. Identifying questions
 - b. Identifying formula/equation
 - c. Interpreting results

B. Data

1. Collection
2. Classification: levels/scales of measurement
3. Organization
4. Summarization
 - a. Graphing
 - b. Measures of central tendency
 - c. Measures of variation/spread
 - d. Percentiles and quartiles

C. Probability

1. Empirical and mathematical probabilities
2. Probability rules
3. Probability distributions: discrete and continuous
 - a. Binomial
 - b. Normal
 - c. T
 - d. Chi-squared
4. Random variables and expected value

D. Sampling

1. Methods
2. Central Limit Theorem
3. Sampling distributions

E. Statistical Inference

1. Confidence interval estimate
 - a. Error of estimate

- b. Size of sample
- 2. Hypothesis testing
 - a. Level of significance and p-value
 - b. Type I and II errors
- 3. Inferences from one sample
 - a. Estimates of population mean and proportion
 - b. Testing a claim about mean and proportion
- 4. Inferences from two samples
 - a. Inferences about two means
 - b. Inferences about two proportions
- 5. Chi-Squared Tests
- 6. ANOVA
- F. Linear Correlation and Regression
 - 1. Scatter diagram
 - 2. Pearson correlation coefficient and coefficient of determination
 - 3. Regression line
 - 4. Prediction
- G. Calculator and Computer Applications
 - 1. Working with data
 - 2. Simulations
 - 3. Inference

METHODS OF INSTRUCTION:

- A. Lecture:
- B. Online:
- C. Independent Study:
- D. Hybrid:

INSTRUCTIONAL TECHNIQUES:

COURSE ASSIGNMENTS:

Reading Assignments

- A. Textbook.
- B. Websites.
- C. Statistical study from a current journal.

Writing Assignments

- A. Complete written solutions to homework, quiz, and test problems.
- B. Written reports and/or projects.
- C. Demonstrate use of a calculator and/or computer in analyzing and comparing data.

Out-of-class Assignments

- A. Individual and/or group projects.
- B. Calculator and/or computer assignments.

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Essay Examinations
Objective Examinations
Report
Projects (ind/group)
Problem Solving Exercises

Oral Presentations
Skills Demonstration

Demonstration of Critical Thinking:

Students will demonstrate critical thinking and problem-solving skills by using logic, in conjunction with past mathematical solving techniques, to solve and interpret a variety of applications not previously seen. Demonstrations will be shown by completing assignments, participating in discussions, and completing required exams and quizzes.

Required Writing, Problem Solving, Skills Demonstration:

- A. Complete written solutions to homework, quiz, and test problems.
- B. Written reports and/or projects.
- C. Demonstrate use of calculator and/or computer in analyzing and comparing data.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

- 1. Navidi and Monk. *Elementary Statistics*, 4th ed. McGraw-Hill Higher Education, 2021
- 2. Illowsky and Dean. *Introductory Statistics*, 1st ed. OpenStax (OER) (latest), 2013

Other:

- 1. TI-83/83+/84/84 Graphing calculator

LIBRARY:

Adequate library resources include:

Comments:

Attachments:

[Attached Files](#)