



Revised By: S. Eveland  
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Date Revised: Fall 2023  
C&GE Approved:  
Board Approved:  
Semester Effective

Psychology (PSYC) 2200 Elementary Statistics for the Behavioral and Social Sciences (4 Units) CSU:UC  
[formerly Psychology 5; C-ID MATH 110; C-ID SOCI 125]

Prerequisite: Qualification by assessment process or successful completion of Mathematics 1060 Intermediate Algebra or equivalent.

Advisory: Eligibility for English 1500 or 1501 strongly recommended

Prerequisite knowledge and skills:

Before entering the course, the student should be able to

1. Use a hand-held calculator to complete basic mathematics (addition, subtraction, multiplication, division, exponents, and square roots),
2. perform the basic arithmetic operations with positive and negative real numbers, plus raising to powers,
3. know and apply the rules of exponents and the order of operations in algebraic calculations,
4. apply the properties of addition and multiplication for real numbers and identify their use in practice,
5. add, subtract, multiply and divide to simplify to lowest terms,
6. solve word problems by applying the order of operations in algebraic calculations,

Hours and Units Calculations:

64 hours lecture. 128 Outside of Class hours. (192 Total Student Learning Hours) 4 Units

Catalog Description: This course provides students with a solid foundation in statistics as used in business, social science, psychological, sociological, and behavioral research such as administration of justice. Students will develop a useable understanding of research design, the organization of data, measures of central tendency and variability, central tendency theory, descriptive and inferential statistics, parametric and nonparametric tests, and basic test assumptions. The course includes application of technology for statistical analysis including the interpretation of the relevance of the statistical findings. Applications use data from disciplines including business, social sciences, psychology, life science, health science, and education. C-ID: SOCI 125. C-ID: MATH 110

Type of Class/Course: Degree Credit

Thorne, Michael and Martin Giesen. *Statistics for the Behavioral Sciences*. 4<sup>th</sup> ed. New York: McGraw, 2002. Print.

Oja, Michelle. *PSYC 2200: Elementary Statistics for Behavioral and Social Sciences*. LibreText Library Open Educational Resource Center  
[https://stats.libretexts.org/Courses/Taft\\_College/PSYC\\_2200%3A\\_Elementary\\_Statistics\\_for\\_Behavioral\\_and\\_Social\\_Sciences\\_\(Oja\)\\_2021](https://stats.libretexts.org/Courses/Taft_College/PSYC_2200%3A_Elementary_Statistics_for_Behavioral_and_Social_Sciences_(Oja)_2021).  
Electronic.

Additional Required Instructional Materials: Statistics capable handheld calculator

**Course Objectives:**

By the end of the course, a successful student will be able to

1. Interpret data displayed in tables and graphically;
2. Apply concepts of sample space and probability;
3. Calculate measures of central tendency and variation for a given data set;
4. Identify the standard methods of obtaining data and identify advantages and disadvantages of each;
5. Calculate the mean and variance of a discrete distribution;
6. Calculate probabilities using normal and  $t$ -distributions;
7. Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem;
8. Construct and interpret confidence intervals;
9. Determine and interpret levels of statistical significance including  $p$ -values;
10. Interpret the output of a technology-based statistical analysis;
11. Identify the basic concept of hypothesis testing including Type I and II errors;
12. Formulate hypothesis tests involving samples from one and two populations;
13. Select the appropriate technique for testing a hypothesis and interpret the result;
14. Use regression lines and ANOVA for estimation and inference, and interpret the associated statistics;
15. Use appropriate statistical techniques to analyze and interpret applications based on data from at least four of the following disciplines: business, economics, social science, psychology, political science, administration of justice, life science, physical science, health science, information technology, and education;
16. Practice and use basic mathematical techniques;
17. Conduct elementary numerical computations; interpret the results in written form;
18. Organize, classify, and represent quantitative data in the social and behavioral sciences in various forms: tables, graphs, rates, percentages, measures of central tendency and variation;
19. Make statistical inference using estimation, hypothesis testing, correlation, and regression; and
20. Demonstrate familiarity with applications to social and behavioral data sets in statistical software.

**Course Scope and Content:**

- Unit I     Statistics as a Language
- A. Statistics in everyday life
  - B. Research design and the role of statistics
    1. Research terminology
    2. Basic statistical terms
- Unit II    Descriptive Statistics
- A. Definitions and Scaling
    1. Random variables and expected value
    2. Measurement
  - B. Frequency Distribution and Graphing
    1. Organizing data
    2. Summarizing data graphically and numerically
    3. Sampling and sampling distributions
    4. Discrete distributions – Binomial
    5. Continuous distributions – Normal

- C. Measures of Central Tendency – Normal Distribution
  - 1. Mean, median, and mode
  - 2. Central tendency theory
- D. Measures of Dispersion – Normal Distribution
  - 1. Range, variance, standard deviation, estimated standard deviation
  - 2. Central limit theorem
- E. Standardized Scores
  - 1. Conversion from raw data points
  - 2. Using a standardized score table
- F. Probability
  - 1. Sample spaces and probability
  - 2. Random variables and expected values

Unit III Inferential Statistics - Parametric

- A. Confidence Intervals and Hypothesis Testing
  - 1. Estimation and confidence intervals
  - 2. Hypothesis Testing and Inference
- B. Significance of Difference Between Two Sample Means
  - 1. *t*-tests for one and two populations  
     as appropriate inference
  - 2. Probability
- C. One-way Analysis of Variance (ANOVA)
  - 1. *Post hoc* Comparisons
- D. Two-way Analysis of Variance (ANOVA)
- E. Correlation and Regression
  - 1. Correlations, regression lines, and prediction
  - 2. Summarizing data graphically and numerically

Unit IV Inferential Statistics - Non-Parametric Testing

- A. Chi Chi-Square – Goodness of Fit and
- B. Chi Chi-Square – Test of Independence
  - 1. Hypothesis Testing and Inference
- C. Alternative tests for *t*-test and *F*-test
  - 1. Hypothesis Testing and Inference

Unit V Applications

- A. using data from at least four (4) of the following disciplines:
  - 1. Political science
  - 2. business
  - 3. economics
  - 4. social science
  - 5. psychology
  - 6. administration of justice
  - 7. life science
  - 8. physical science
  - 9. health science
  - 10. information technology
  - 11. education
  - 12. Business
  - 13. Social Sciences
  - 14. Psychology



## 15. Administration of Justice

- Unit VI Technology Based Statistical Analysis
- A. Statistical Package for Social Sciences (SPSS)
  - B. Excel or similar spreadsheet applications
  - C. Statistics-capable handheld calculators
  - D. Other technology-based statistical analysis tools

### Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 8 hours per week outside of the regular class time doing the following:

- 1. Individual study
- 2. Skills practice
- 3. Group study
- 4. Completing required reading
- 5. Performing an individually determined data collection and analysis exercise
- 6. Writing a research paper based on the individually determined data collection and analysis exercise

### Methods of Instruction:

- 1. Lecture on statistical theory/research theory
- 2. Group discussion
- 3. Instructor demonstrated problem solving
- 4. Instructor led problem solving
- 5. Individual problem solving with instructor guidance
- 6. Group problem solving with peer guidance
- 7. Individual problem solving
- 8. Individual statistical culminating project paper

### Methods of Evaluation:

- 1. Computational and non-computational problem-solving demonstrations including:
  - a. exams
  - b. homework problems
  - c. quizzes
  - d. discussions
  - e. peer review/observation
  - f. instructor review/observation
  - g. culminating project paper
  - h. comprehensive final exam

### Supplemental Data:

TOP Code:	200100: Psychology, General
SAM Priority Code:	E: Non-Occupational



Distance Education:	Online: Hybrid; Offline
Funding Agency:	Y: Not Applicable (funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	E: Credit By Exam
Eligible for Pass/No Pass:	C: Pass/No Pass
Taft College General Education:	CSB4: CSU Area B4 IG2A: IGETC Area 2A LCAT: Local GE Communication
Discipline:	Psychology