PSYC G140: STATISTICS FOR THE BEHAVIORAL SCIENCES

Item	Value
Curriculum Committee Approval Date	10/20/2020
Top Code	170100 - Mathematics, General
Units	4 Total Units
Hours	72 Total Hours (Lecture Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 2A Math Concepts (2A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 2A Math Concepts (2A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

This course will explore the use of probability techniques, hypothesis testing, and predictive techniques to facilitate decision-making. Topics include descriptive statistics; probability and sampling distributions; statistical inference; correlation and linear regression; t-tests; analysis of variance, chi-square tests; and application of technology for statistical analysis including the interpretation of the relevance of the statistical findings. Applications using data from disciplines including psychology, social sciences, life and health sciences, and education. Enrollment Limitation: ECON G160/STAT C1000/STAT C1000E/SOC G125; students who complete PSYC G140 may not enroll in or receive credit for ECON G160, STAT C1000, STAT C1000E, or SOC G125. PREREQUISITE: Course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC: Credit Limitation: BIOL G260, ECON G160, MATH G103, MATH G160, MATH G160S, STAT C1000, STAT C1000E, PSYC G140 and SOC G125 combined: maximum credit, 1 course. C-ID: MATH 110.**C-ID:** MATH 110.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Demonstrate the ability to calculate key statistics such as levels of measurement, measures of central tendency and variability, frequency distributions, normal skewed curves, probability, sampling, and statistical inference, hypothesis testing, z-scores, t-tests, ANOVA, correlation, regression, and chi-square.
3. Complete an assignment utilizing APA format with research data by accurately selecting and computing the appropriate statistical test(s) and interpret results.
4. Use statistical software to analyze data and interpret results.

Course Objectives

- 1. Calculate the use of statistics in general, and specifically in behavioral science research.
- 2. Explain key statistical concepts and correctly use associated terminology.
- 3. Differentiate between descriptive and inferential statistics.
- 4. Discriminate between different scales/levels of measurement and calculate the appropriate measures of central tendency variability depending on the shape of the distribution and scale/level of measurement.
- 5. Interpret data displayed in tables and graphs.
- 6. Apply concepts of sampling and probability.
- 7. Calculate and interpret descriptive statistics for a given set of data.
- 8. Calculate probabilities using normal z-score and t-distributions.
- 9. Distinguish between sample and population distributions and analyze the role played by the Central Limit Theorem.
- 10. Construct and interpret confidence intervals.
- 11. Discuss correlational research and analysis, conduct associated computations, and interpret results.
- 12. Identify the concepts of hypothesis testing, including Type I and II errors.
- 13. Perform hypothesis testing and interpret the results.
- 14. Formulate hypothesis tests involving samples from one or more populations.
- 15. Determine and interpret levels of statistical significance with p-values.
- 16. Use linear regression and ANOVA for estimation and inference as well as interpret the associated statistics.
- 17. Compute and interpret effect size statistics.
- 18. Perform statistical analysis using software such as SPSS, PSPP, EXCEL, R, or similar programs, and interpret results/output.
- 19. Use statistical techniques to analyze and interpret applications based on data from disciplines including psychology, business, social sciences, psychology, life science, health science, and education.

Lecture Content

Summarizing data graphically and numerically; Descriptive statistics: measures of central tendency, variation, skewness and kurtosis, relative position Sample spaces and probability; Random variables and expected value; Sampling and sampling distributions; Binomial distributions; Normal distributions; The Central Limit Theorem; Estimation and confidence intervals; Hypothesis Testing and inference, including t-tests for one and two populations, and Chi-square test; Correlation and linear regression Analysis of variance (ANOVA) for one and two independent variable designs; Graphing and interpreting interactions; Determine appropriate analysis given hypothesis, level of measurement, and research design Applications using data from various disciplines including psychology, social sciences, life and health sciences, and education; and business; Statistical analysis using technology such as SPSS, EXCEL, R, or graphing calculators.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Instructional Techniques

Classroom lecture / discussion / group activities Text and supplemental readings

Reading Assignments

Readings from primary text and supplemental reader Results sections of published research articles (identify levels of measurement, design, discuss analysis and appropriate conclusions) Topical articles related to statistical analyses and applications

Writing Assignments

Written questions (short answer and essay) on exams Written assignments (critique / interpretation) of analyses

Out-of-class Assignments

Homework problems based on lecture/discussion and text readings Data analysis problems Group projects (e.g., operationalize variables, collect and analyze data, draw appropriate conclusions)

Demonstration of Critical Thinking

Written assignments Critiques of analyses in studies Data set projects Written questions on exams Homework problem sets

Required Writing, Problem Solving, Skills Demonstration

1. Conceptual questions on exams2. Conceptual questions in homework assignments3. Data set projects4. Critiques of analyses in research sections of published studies5. Determine appropriate analysis for given set of data

Eligible Disciplines

Psychology: Masters degree in psychology OR bachelors degree in psychology AND masters degree in counseling, sociology, statistics, neuroscience, or social work OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Gravetter, F. J. Walnau, L. B.. Statistics for the Behavioral Sciences, 9th ed. Cengage, 2018 2. Required Howell, D. C.. Fundamental Statistics for the Behavioral Sciences, 9th ed. Wadsworth, 2017 3. Required Takunaga, H. T.. Fundamental Statistics for the Social and Behavioral Sciences, 2nd ed. Sage, 2019

Other Resources

1. Instructor Prepared Materials