GROSSMONT COLLEGE

COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 03/22/2022

GCCCD Governing Board Approval: 04/19/2022

PSYCHOLOGY 215 – STATISTICS FOR THE BEHAVIORAL SCIENCES

1. Course Number Course Title Semester Units

PSY 215 Statistics for the Behavioral Sciences 4

Semester Hours 4 units

3.5 hours lecture: 56-63 hours 112-126 outside-of-class hours

1.5 hours lab: 24-27 hours 192-216 total hours

2. Course Prerequisites

A “C” grade or higher or “Pass” in Math 103 or Math 110 or equivalent or appropriate placement beyond intermediate algebra.

Corequisite

None

Recommended Preparation

None

3. Catalog Description

Methods and experience in defining and solving quantitative problems in the behavioral sciences. Emphasis is on the design of experiments and the application of a variety of parametric and nonparametric techniques to the analysis of data.

4. Course Objectives

The student will:

1. Represent data in its visual forms using bar charts, histograms, scatter plots, etc**.**
2. Describe data with measures of central tendency and variability.

c. Analyze representative data from the behavioral sciences using a variety of statistical techniques.

d. Compose written discussions of statistical problems.

e. Integrate statistical hypothesis-testing into the framework of scientific methodology.

f. Explain the statistical decision relative to probabilities.

g. Evaluate the limitations of statistical inference.

h. Apply statistical considerations to the formulation of hypotheses and the specific design of experiments.

i. Use SPSS or other software for the presentation and analysis of quantitative data.

5. Instructional Facilities

a. Standard classroom.

b. Computer laboratory equipped with SPSS software.

6. Special Materials Required of Student

Calculator capable of the four functions of arithmetic with a square root function.

7. Course Content

1. Introduction to statistical thinking, basic concepts of statistics, types of data, scales of measurement, descriptive vs. inferential statistics and sampling techniques.
2. The application of data in its visual form using bar charts, diagraphs, scatter plots, etc.
3. Measures of central tendency and variability.

d. Introduction to probability distributions: the normal probability distribution and the binominal distribution.

e. Estimation and hypothesis testing.

1) Distribution of sample means, standard error, and Central Limit Theorem.

2) Student’s “t” distribution: single, dependent, independent means.

3) Confidence intervals and hypotheses testing.

4) Power and effect size, Type I and Type II errors.

f. Analysis of variance.

1) Variances of samples and their means, “F” distribution.

2) Null hypothesis, partitioning the total sum of squares and degrees of freedom.

3) Heterogeneity among sample means.

g. Single classification ANOVA: comparison of means (a priori and a posteriori testing).

h. Two-way ANOVA with and without replicating; significance testing.

i. Assumptions of analysis of variance: nonparametric methods in lieu of ANOVA.

j. Regression: basic computations, tests of significance, uses.

k. Correlation: product-moment correlation coefficient, significance tests, applications, nonparametric methods.

l. Analysis of frequencies: Chi-Square test for goodness of fit and test for independence.

m. Applications using data from disciplines including business, social sciences, psychology, life science, health science, and education.

n. Statistical analysis and interpretation using software such as SPSS, EXCEL, or Minitab.

8. Method of Instruction

a. Lecture and group discussions.

b. Multimedia presentations.

c. Supervised problem-solving.

d. Discussion of written assignments.

e. Cooperative learning structured exercises.

f. Discussion of library materials and textbook readings.

9. Methods of Evaluating Student Performance

A grading system will be established by the instructor and implemented uniformly. Grades will be based on student proficiency in subject matter determined by multiple measurements for evaluation, including:

a. One or more exams that include both objective and essay questions.

b. A comprehensive final exam that includes both objective and essay questions.

c. Statistical problem-solving assignments emphasizing behavioral science applications.

d. Written assignments and/or oral presentations. Example assignments include producing an APA results section of a given data set OR the analysis of the statistical methods used in a recent published study OR evaluating claims made in popular media that misrepresent the conclusions made in a recent published study.

10. Outside Class Assignments

1. Weekly required readings before class meetings. This could include the textbook, primary literature, or a relevant article in popular media. This may also include viewing instructional videos designed for a flipped classroom model.

b. Statistical problem-solving assignments.

c. Written assignments such as producing an APA results section of a given data set OR the analysis of the statistical methods used in a recent published study OR evaluating claims made in popular media that misrepresent the conclusions made in a recent published study.

11. Representative Texts

a. Representative Text(s):

Gravetter, F., Wallnau, L., Forzano, L., and Witnauer, J. *Essentials of Statistics for the Behavioral Sciences*, 10th edition, Boston, MA: Cengage. 2021.

b. Supplementary texts and workbooks:

As selected by the instructor and made available in library reserves.

Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

* 1. Demonstrate their understanding of why statistics is used and what the limitations of statistical inference are.
  2. Analyze representative data from the behavioral sciences using a variety of statistical techniques
  3. Apply statistical considerations to experimental design.
  4. Interpret the results of statistical analyses in writing using APA format.
  5. Use SPSS for the analysis of quantitative data.