# San Bernardino Valley College
# Course Outline for Psychology 105
# "Statistics for the Behavioral Sciences"

## I. CATALOG DESCRIPTION

A.  PSYCH 105:  Statistics for the Behavioral Sciences
    3 hours lecture = 3 units

    Statistics as applied to the social sciences including such topics as
    measurement, frequency distributions, measure of central tendency,
    measures of variability, the normal distribution curve, correlation,
    sampling, statistical inference, hypothesis testing and an introduction to
    analysis of variance.

    Prerequisite:  PSYCH 100

B.  SCHEDULE DESCRIPTION: Statistics as applied to the social sciences
    including such topics as measurement, frequency distributions, correlation,
    sampling, statistical inference, and hypothesis testing.

## II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

## III. EXPECTED OUTCOMES FOR STUDENTS:

Upon successful completion of this course, students should be able to:

**A.**  Explain the nature and use of statistics in general and specifically in
        behavioral science research.

**B.**  Describe the relationship between descriptive and inferential statistics.

**C.**  Explain abstractions and probability.

**D.**  Critically evaluate the validity of statistical data.

**E.**  Demonstrate which statistical test is appropriate to answer specific
        research questions.

**F.**  Demonstate the computational skills necessary to statistically analyze
        data.

## IV. CONTENT:

A.  Introduction
    1.  Math Anxiety
    2.  Use and Misuse of Statistics
    3.  Descriptive and Inferential Statistics
    4.  Levels of Measurement
B.  Descriptive Statistics
    1.  Graphing
    2.  Measures of General Tendency
    3.  Measures of Variability
C.  The Normal Curve, z-scores, T-scores, and Probability
D.  Statistics and Parameters
    1.  Sampling Distributions
    2.  Standard Error of the Mean
    3.  Standard Error of Difference
    4.  Confidence Intervals
E.  The Hypothesis of Difference
    1.  t-test (two-tailed and one-tailed)
F.  They Hypothesis of Association
    1.  Pearson r
    2.  Spearman r
G.  The Fundamentals of Research Methodology
H.  Analysis of Variance
    1.  One-Way Anova
    2.  Factorial Anova
I.  Nominal Data and Chi Square
J.  Before-After and Matched-Group Designs with Interval Data
K.  Choosing the Correct Statistical Test

## V.  METHODS OF INSTRUCTION:

The course is designed under the lecture/discussion format.  The instructional methods to be used include:

A.  Lecture
B.  Class and group discussions of significant issues and topics
C.  Relevant videotapes and films
D.  Written assignments and problem-sets, both in and out of class
E.  Skill exercises
F.  Small group activities
G.  Research papers
H.   Field trips
I.  Computer-Assisted Instruction

## VI.  TYPICAL ASSIGNMENTS:
   A.  Reading both in and out of class in preparation for exams and paper-writing on behavioral statistics issues, such as the difference between t-tests and ANOVA.
   B.  Class and group discussion of significant issues and topics in preparation for exams and paper-writing on behavioral statistics issues, such as when a variable is being measured on a nominal ordinal, interval, or ratio scale.
   C.  View relevant videotapes and films in preparation for exams and paper-writing on behavioral statistics issues, such as a film describing he difference between descriptive and inferential statistics.
   D   Written assignments on behavioral statistics issues, frequently graded
   E   Skill-development exercises either written or demonstrated
   F.  Small group activities, such as choosing of appropriate test statistics for a variety of research designs
   G.  Research papers on self-chosen, personally relevant topic
   H.  Field trips to specific educational or career-skill workshops

## VII.  METHODS OF EVALUATION

   A.  **Methods of Evaluation**: This will vary from instructor to instructor, but may include true-false tests, multiple choice tests, computational tests, or sentence completion tests.  In addition, written components such as essay tests, writing tasks (i.e. research write-ups, summary reviews, interpretive essays, and/or term projects) may be included.  Telecomputing can include downloading and uploading reading and writing tasks, on-line discussion, and computer tutorials.
   B.  **Frequency of Evaluation**: This will depend on the type of evaluation (i.e. "objective" or essay).  Evaluation will take place periodically throughout the semester with enough frequency to be sufficient to measure student progress and will be sensitive to the various learning styles of students.  Typically this could be weekly quizzes or papers, or one or two midterm exams, plus a final exam and/or semester projects.

   Student assignments outside of class are assumed to be the equivalent of 6 hours per week and may include reading, computer-assisted instruction, writing tasks, preparing for exams, and/or study group discussions.

   Grading may be comparative within a class or may be based on an absolute standard.
   C.  **Typical Exam Questions**:  These might include computational demonstration of analysis of variance or determining the correlation coefficient from a set of scores, or could be multiple-choice questions asking which statistical test was most appropriate for assessing the relationships between two dichotomous variables.

## VIII.  TYPICAL TEXT:

   Sprinthall, Richard.  Basic Statistical Analysis (5th ed.).  Reading, MA.:  Addison-Wesley Publishing Co., 1997

## IX.  OTHER SUPPLIES REQUIRED OF STUDENTS: None