

**IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE**

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE:** September 2007

COURSE TITLE: Elementary Statistics **COURSE NO.:** MATH 119 **UNITS:** 4

LEC HRS. 4 **LAB HRS.** _____ **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

Graphical representation of statistical data, calculations, and uses of various averages, measures of variability, introduction to probability, probability distributions, confidence intervals, sample size determination and hypothesis testing, ANOVA, linear regression and Chi-square analysis. Students will learn to use technology to find confidence intervals, test statistics, regression lines, and to produce graphics. This course also provides supervised practice in the appropriate use of technology designed to assist students in calculations required in beginning statistics.

II. A. PREREQUISITES, if any:

MATH 090 with a grade of "C" or better, or appropriate placement.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

ENGL 101 or ENGL 111

III. GRADING CRITERIA:

 X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will distinguish the various ways of organizing, displaying, and measuring data.
2. The student will derive the numerical relationship that exists between bivariate data sets.
3. The student will demonstrate an understanding of the theory of probability and proficiency in solving problems of this nature.
4. The student will compute and interpret expected values and variance, and learn about the binomial distribution for discrete random variables.
5. The student will compute and interpret expected values and variance, and learn about the normal distribution for continuous random variables.
6. The student will examine the joint probability structure of two or more random variables and understand the limiting behavior of the sum of independent random variables as the number of the sample becomes larger.
7. The student will use the various types of distributions that are derived from the normal distribution.
8. The student will calculate and interpret confidence intervals for a population mean to show how probability connects to this type of statistical inference.
9. The student will use hypothesis testing as a formal means of distinguishing between probability distributions on the basis of random variables generated from one of the distributions.
10. The student will compare the means of the data from experiments involving more than two samples, including the single factor analysis of variance (ANOVA).
11. The student will fit a straight line to the given data in graphical form.
12. The student will make use of Chi-square distributions to analyze counts.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	<u>CORE CONTENT</u>	<u>APPROX. % OF COURSE</u>
1.	Introduction and descriptive statistics A. An overview of statistics B. Pictorial and tabular methods in statistics C. Measures of location D. Measures of variability	10%
2.	Bivariate data analysis A. Displaying bivariate data B. Correlation coefficient C. Least squares line	5%
3.	Probability A. Sample spaces and events B. Axioms C. Interpretations D. Properties of probability E. Computing probabilities F. Conditional probability G. Independence	10%
4.	Discrete random variables A. Random variables B. Probability distributions C. Expected values D. Variance and standard deviation E. The binomial distribution F. The Hypergeometric distribution	10%
5.	Continuous random variables A. Probability distributions B. The Uniform distribution C. The Normal distribution	5%
6.	Joint probability distribution and random samples A. Jointly distributed random variables B. Expected values C. Covariance and correlation D. The Central Limit Theorem E. Sums and averages F. Simple random sampling	10%
7.	Distributions derived from the normal distribution A. Chi-square distribution B. The T- distribution and F-distribution	10%
8.	Interval estimation A. Confidence intervals for a mean of normal populations B. Confidence intervals for population proportions C. Large-sample intervals for population means D. Small-sample intervals for means of normal population	10%
9.	Hypothesis testing A. Tests about the mean of a normal population B. Large-sample tests for a population mean C. Large-sample tests for population proportions D. The t-test E. Tests for differences between two population means F. Tests about means from matched pairs G. Type I and type II errors	10%
10.	The single factor analysis of variance (ANOVA)	5%
11.	Linear regression A. Statistical properties of the estimated slope and intercept B. Assessing the fit C. Correlation and regression	5%
12.	Analysis of counts A. Chi-square test of independence B. Chi-square test of homogeneity C. Goodness of fit	10%
TOTAL		100%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	<u> X </u>	Class Activity	<u> X </u>	Written Assignments	<u> X </u>
Problem Solving Exercise	<u> X </u>	Final Exam	<u> X </u>	Oral Assignments	<u> X </u>
Skill Demonstration	<u> X </u>	Objective	<u> X </u>	Quizzes	<u> X </u>
Other	<u> X </u>				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	<u> X </u>	Discussion	<u> X </u>	Demonstration	<u> X </u>
Audio Visual	<u> X </u>	Group Activity	<u> X </u>	Lab Activity	<u> X </u>
Computer Assisted Instruction	<u> X </u>	Individual Simulation/ Assistance	<u> X </u>	Case Study	<u> X </u>
<p>Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____</p>					
Other	<u> X </u>				
Online	<u> X </u>				

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Triola, Mario. *Elementary Statistics*, 10th edition. Addison-Wesley, 2006.

Triola, Mario. *Essentials of Statistics*, 3rd Edition. Addison-Wesley, 2006.

Brase and Brase. *Understandable Statistics Concepts and Methods*, 8th Edition. Houghton-Mifflin, 2006.

Gravetter, Frederick J. and Larry B. Wallnau. *Essentials of Statistics for the Behavioral Sciences*. Wadsworth Publishers, 2005.

Moore, David S. *The Basic Practice of Statistics*, 4th Edition. W.H. Freeman and Company, 2007.

Software as needed: *Microsoft Excel, Minitab, Fathom, StatDisk, or Graphing Calculators*

