City Colleges of Chicago Course Title: Introductory Statistics (IAI Code: M1 902)

Length of course: 16 Weeks

Contact Hours: 4 Contact Hours

Credit Hours: 4 Credit Hours

Lecture Hours: 4 Lecture Hours

Lab Hours:

Weekly Plan: 4 Hours

Catalogue Description:

Introductory Statistics provides students with an opportunity to acquire a reasonable level of statistical literacy as it applies to a variety of societal issues. This course emphasizes interpretations and applications of techniques using descriptive and inferential statistics. Topics include frequency distributions, histograms, and measures of central tendency, measures of dispersion, and measures of position, probability concepts, the binomial distribution, the normal distribution, the Central Limit Theorem, confidence intervals, hypothesis testing, and an introduction to correlation. The use of technology (e.g., graphing calculator, computer software, etc.) is an integral part of this course. Writing assignments, as appropriate to the discipline, are part of the course.

Students the Course is Expected to Serve:

This course is intended for students who are liberal arts majors and require a general education mathematics course for their undergraduate degree or for students whose programs require introductory statistics.

Pre-requisites:

Prerequisite -- MATH 099 with a minimum grade of 'C' or Placement Test -- or Consent of Chair --

Course Objectives:

- 1. Develop statistical reasoning as it relates to contextual (real-world) scenarios.
- 2. Apply statistical techniques to data from various representations.
- 3. Interpret statistical results appropriately (verbally and in writing).
- 4. Use technology to perform statistical computations and explore statistical concepts.

Student Learning Outcomes:

Upon satisfactory completion of the course, students will be able to:

- A. Construct a frequency distribution from raw data.
- B. Interpret data presented in tabular form and graphical form (e.g., histogram, stem-and-leaf plot, box-and-whisker, scatterplots, etc.).
- C. Demonstrate knowledge and appropriate use of statistical terms such as: population, sample, variable, and data classifications (i.e., qualitative data, quantitative data, discrete data, etc.).
- D. Identify sampling techniques (random versus non-random).
- E. Interpret information using the measures of central tendency from a contextual-based (realworld) scenario.

- F. Interpret information using the measures of variation (dispersion) from a contextual-based (real-world) scenario.
- G. Compute and interpret the correlation coefficient for small data sets.
- H. Apply the Empirical Rule and Chebyshev's Theorem to a contextual-based (real-world) scenario.
- I. Interpret information using the measures of position from a contextual-based (real-world) scenario.
- J. Demonstrate knowledge of terms related to probability such as: experiment, outcome, sample space, event, empirical (experimental) probability, and classical (theoretical) probability.
- K. Apply the rules of probability to a contextual (real-world) situation.
- L. Construct a probability distribution for a discrete random variable.
- M. Compute the mean (expected value) and variance of a discrete probability distribution.
- N. Compute probabilities, means, and variances of binomial distributions.
- O. Demonstrate knowledge of the properties of a normal and a standard normal distribution.
- P. Compute an area under the normal curve.
- Q. Apply the normal distribution and Central Limit Theorem to a contextual (real-world) situation.
- R. Demonstrate knowledge of terms related to interval estimation such as point estimate, confidence level, confidence interval, and margin of error.
- S. Compute a confidence interval (for small and large samples) or minimum sample size needed for the population mean and population proportion.
- T. Demonstrate knowledge of terms related to hypothesis testing (e.g., null and alternative hypotheses, significance level, etc.).
- U. Perform a hypothesis test (for small and large sample sizes) of the population mean and population proportion.

Topical Outline: (Suggested Timeframe only.)

<u>Week</u>	Course content and Exams
1 - 7	Introduction to Statistics
	Populations vs. Samples
	Data Types & Data Description
8 - 10	Introduction to Probability
	Probability Rules
	Discrete Probability Distributions
	Binomial Distribution
11 - 13	Normal Distribution
	Central Limit Theorem
	t Distribution
14 - 16	Estimation
	Hypothesis Testing
	Regression & Correlation

Calendar:

Methods of Evaluation:

Total Percentage: 0%

The weight given to exams, quizzes, and other instruments used for evaluation will be determined by the instructor.

Methods of Assessment:

Exams, quizzes, homework and other assessments will be used as appropriate to measure student learning.

Methods of Instruction:

Problem-based activities, collaborative-learning techniques, and lecture will be used as appropriate.

Recommended Text:

- 1. Bluman, Allan G. *Elementary Statistics: A Step By Step Approach* 6th Edition, McGraw Hill, 2004 ISBN: 0073048259
- 2. Freund, J., & Perles, B. Modern Elementary Statistics 12th Edition, Prentice Hall, 2007

Preparation Date: 01/15/2009

CID: 7179