SUFFOLK COUNTY COMMUNITY COLLEGE
COLLEGE-WIDE COURSE SYLLABUS
MAT103

I.   COURSE TITLE:

Statistics I

II.   CATALOG DESCRIPTION:

For students interested in social sciences, health sciences, business and industry. Theory of probability is used to develop methods of statistical inference, confidence intervals and decision theory. Topics include sample spaces, statistical models, binomial and normal distribution, t-distribution and chi-square distribution. Note: Fulfills SUNY-GE Mathematics. Prerequisite: MAT006, MAT007, MAT009 or equivalent. Offered on: A-E-G / 3 cr. hrs.

III.   COURSE GOALS:

A.   Introduce the basic ideas of probability and statistics.
B.   Discuss both descriptive and inferential statistics.
C.   Show students the wide applications of statistical methods.
D.   This course satisfies the SUNY general education requirement for mathematics.

IV.   COURSE OBJECTIVES:

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

1.   Demonstrate an understanding of basic statistical terms;
2.   Organize and describe data, mathematically and pictorially;
3.   Understand and compute measures of central tendency and variability;
4.   Apply basic probability principles;
5.   Write and do basic analysis using binomial, normal, t, and chi square distributions;
6.   Understand and apply the central limit theorem;
7.   Understand, conduct and interpret hypothesis tests;
8.   Understand, construct and interpret confidence intervals.

V. Topics Outline with Timeline

Topics	Approximate Time (Including Examinations)
A. Introduction 1. Population versus sample 2. descriptive statistics versus inferential statistics 3. brief history of statistics (optional)	1 week
B. Descriptive Statistics 1. graphical methods for displaying data a. bar graphs	2 ½ weeks

b. histograms and frequency polygons
    c. cumulative frequency polygon (optional)
  2. measures of central tendency
    a. mean (including mean of grouped data), median, mode, and midrange
  3. measures of location and percentiles (optional)
  4. measures of variability
    a. range
    b. standard deviation and variance (including grouped data)
    c. average deviation (optional)
    d. Chebyshev's Theorem (optional)	

C. <u>Probability Theory and Distributions</u>
  1. overview of probability theory
    a. sample spaces and empirical methods
    b. probabilities of (A or B) and (A and B)
    c. decision trees and risk analysis (optional)
  2. probability distributions
    a. discrete probability distributions
    b. continuous probability distributions
	2 ½ weeks

D. <u>Binomial Distribution</u>
  1. definition of a Bernoulli trial
  2. table method of determining binomial probabilities and creation of histogram
  3. formula method of determining binomial probabilities
  4. mean and standard deviation of a binomial distribution
  5. applications of the binomial distribution
	1 week

E. <u>Normal Distribution</u>
  1. introduce the standard normal curve and concept of z-score
  2. general normal distribution
  3. normal approximation to binomial distribution
	1 ½ weeks

F. <u>Central Limit Theorem</u>
  1. sampling distributions
  2. introduction to methods of inferential statistics and sampling distributions
	½ week

G. <u>Estimation of Parameters</u>
  1. point estimates versus interval estimates and bounds of error
  2. confidence intervals
    a. population mean
    b. population proportion (optional)
  3. sample sizes (optional)
	2 weeks

H. <u>Hypothesis Testing</u>
  1. structure of a hypothesis test
  2. tests involving the mean
    a. large samples
    b. small samples – t-distributions
	3 weeks

3. tests involving a proportion
4. chi-square distribution
    a.   test of independence
    b.   test of goodness-of-fit
5. tests for comparing of two population means – large
6. samples (optional)
7. tests comparing two proportions (optional)	

I. Review and Reassessment
    1. overview of inferential statistics – a real-world approach
    2. critical need for a random sample in statistical projections
	½ week

J. Optional Topic: Correlation and Regression
    1. scatter diagrams for paired data
    2. least square line and correlation coefficients	

VI. Evaluation of Student Performance:

To be determined by the instructor

VII. Programs that require this course:

Accounting/AAS (recommended)
Business Administration/AAS (required)
Business: Marketing/AAS (required)
Business: Office Management/AAS (required)
Chemical Dependency Counseling/AAS (required)
Communications and Media Arts: Journalism/AA (recommended)
Criminal Justice/AS (recommended)
Dietetic Technician/AAS (recommended)
Health Information Technology/Medical Records/AAS (required)
Information Technology/AAS (recommended)
Liberal Arts and Sciences: International Studies Emphasis/AA (required)
Liberal Arts and Sciences: Science Emphasis-Biotechnology Option/AA (recommended)
Liberal Arts and Sciences: Social Science Emphasis/AA (required)

VIII. Courses that require this course as a prerequisite:

BMKT218, BUS207, HIT225, MAT104

IX. Supporting Information:

Mathematics tutoring services, as well as video and computer aids, are provided for all students through the Math Learning Center (Ammerman Campus, Riverhead 235), the Center for Academic Excellence (Grant Campus, Health, Sports and Education Center 129), and the Academic Skills Center (Eastern Campus, Orient 213).