Douglas College

EFFECTIVE: SEPTEMBER 2004
CURRICULUM GUIDELINES

A.	Division:	Instructional	Effective Date:		September 2004		
B.	Department / Program Area:	Mathematics Faculty of Science & Technology	Revision	X	New Course		
			If Revision, Section(s) Revised:		C, H		
			Date of Previous Revision:		June 28, 2002		
			Date of Current Revision:		September 2004		

C: Math 1160 **D**: Introduction to Statistics **E:** 3

Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description:

A pre-calculus introduction to descriptive statistics, measures of central tendency and variation, elementary probability, probability distributions, sampling, hypothesis testing, regression, correlation and chi-square testing.

G: Allocation of Contact Hours to Type of Instruction / Learning Settings

Primary Methods of Instructional Delivery and/or Learning Settings:

Lecture 2 – 4 hours
Computer Lab 0 – 2 hours

Number of Contact Hours: (per week / semester for each descriptor)

4 hours

Number of Weeks per Semester:

15

H: Course Prerequisites:

Math 1115 or
BC Principles of Math 11 (B or better) or
BC Applications Math 11 (A- or better) or
BC Principles or Applications Math 12

I: Course Corequisites:

None

J: Course for which this Course is a Prerequisite

None

K: Maximum Class Size:

35

L: PLEASE INDICATE:

- [ ] Non-Credit
- [ ] College Credit Non-Transfer
- [X] College Credit Transfer:

SEE BC TRANSFER GUIDE FOR TRANSFER DETAILS (www.bccat.bc.ca)

M: Course Objectives / Learning Outcomes

At the end of the course, the successful student should be able to:

- Define the terms “population” and “sample” as they apply to Statistics
- Define and differentiate between the nominal, ordinal, interval and ratio levels of measurement
- Explain the proper use of Statistics within real world application and provide examples of its abuse
- Have an understanding of experimental design and the use of random number tables and generators
- Employ statistical software such as SPSS and/or Minitab in their own statistical investigations
- Create and interpret frequency tables, histograms, cumulative frequency tables and ogives, stem and leaf displays and scatter plots
- Calculate and interpret measures of central tendency and variation
- Calculate and interpret standard scores
- Understand the classical and relative frequency approaches to probability and employ counting techniques
- Know and apply the addition and multiplication rules for probability and the concept of conditional probability
- Be able to differentiate between discrete and continuous random variables
- Understand and apply Tchebychev’s theorem
- Determine whether the conditions for a Binomial experiment apply and compute the Binomial probabilities
- Compute the mean, variance and standard deviation for the Binomial distribution
- Understand and apply the Poisson and other probability distributions
- Determine probabilities of standard and non-standard normal random variables
- Use the Normal distribution to approximate Binomial probabilities
- Understand and apply the Student t distribution
- Apply the Central Limit Theorem to estimate population parameters using large and small samples
- Apply the Central Limit Theorem to estimate the difference between population parameters
- Perform hypothesis tests on population parameters or the difference between population parameters using large and small samples
- Understand and apply the concepts of Correlation and Regression to multi variable data and create prediction intervals
- Create Contingency Tables and perform goodness-of-fit testing in multinomial experiments

N: Course Content:

1. Introduction to Statistics
   - The nature of data, uses and abuses of statistics, design of experiments statistics with calculator and computers.
2. Describing exploring and comparing data
   - Summarizing data with frequency tables, pictures of data, measures of central tendency, measures of variation, measures of position, exploratory data analysis.
3. Probability
   - Definitions, addition rule, multiplication rule, probabilities through simulation, counting
4. Probability Distributions
   - Random variables, binomial experiments, mean, variance and standard deviation for the Binomial distribution and Poisson distribution
5. Normal Probability Distributions
   - The Standard Normal distribution, non-standard Normal distributions, the Central Limit Theorem, Normal approximation to the Binomial distribution
6. Estimates and Sample Sizes
   - Estimating a population mean: large samples, estimating a population mean: small samples, estimating a population proportion
7. Hypothesis Testing
   - Fundamentals of Hypothesis Testing, testing a claim about a mean: large samples, testing a claim about a mean: small samples, testing a claim about a proportion

8. Inferences from Two Samples
    - Inferences about two means: dependent samples, inferences about two means: independent and large samples, inferences about two means: independent and small samples, inferences about two proportions

9. Correlation and Regression
    - Correlation, regression variation and prediction intervals, multiple regression

10. Multinomial Experiments and Contingency Tables
    - Multinomial experiments: goodness-of-fit, contingency tables: independence and homogeneity

O: Methods of Instruction

Lectures, group work, computer laboratory exercises/assignments.

P: Textbooks and Materials to be Purchased by Students

Moore, **The Basic Practice of Statistics**, 2nd Edition, Freeman, 2000

Q: Means of Assessment

Evaluation will be carried out in accordance with Douglas College policy. The instructor will present a written course outline with specific evaluation criteria at the beginning of the semester.

a. Weekly Quizzes	0 – 20%
b. Term Tests	20 – 70%
c. Computer Labs	0 – 30%
d. Participation/Attendance	0 – 5 %
e. Final Exam	20 - 40%

Note: Students may be required to pass the final exam in order to be eligible to pass the course.

R: Prior Learning Assessment and Recognition: specify whether course is open for PLAR

None

Course Designer(s)

Education Council / Curriculum Committee Representative

Dean / Director

Registrar