



**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
- Create and interpret frequency tables, histograms, cumulative frequency tables, 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
- 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
- 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
- Create confidence intervals for population parameters or their difference using large and small samples.
- Create Contingency Tables and perform goodness-of-fit testing in multinomial experiments using the Chi-square test. (optional)
- Understand and apply Chebychev’s theorem (optional)
- Understand and apply the Poisson and other probability distributions (optional)

**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.
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 using large and small samples, estimating a population proportion.
7. Hypothesis Testing
  - Fundamentals of Hypothesis Testing, testing a claim about a mean using large and small samples, testing a claim about a proportion.
  - Confidence intervals.

<p>8. Inferences from Two Samples</p> <ul style="list-style-type: none"> <li>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</li> </ul> <p>9. Correlation and Regression</p> <ul style="list-style-type: none"> <li>Correlation, regression variation</li> </ul>												
<p><b>O:</b> Methods of Instruction</p> <p>Lectures, group work, assignments.</p>												
<p><b>P:</b> Textbooks and Materials to be Purchased by Students</p> <p>Moore, <u><b>The Basic Practice of Statistics</b></u>, 2nd Edition, Freeman, 2003  Calculator TI83+ or TI84 (optional)</p>												
<p><b>Q:</b> Means of Assessment</p> <p>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.</p> <table data-bbox="284 835 860 1018"> <tr> <td>a. Weekly Quizzes</td> <td>0 - 20%</td> </tr> <tr> <td>b. Term Tests</td> <td>20 - 70%</td> </tr> <tr> <td>c. Tutorials</td> <td>0 - 10%</td> </tr> <tr> <td>d. Participation/Attendance</td> <td>0 - 5 %</td> </tr> <tr> <td>e. Assignments</td> <td>0 - 10%</td> </tr> <tr> <td>f. Final Exam</td> <td>30 - 40%</td> </tr> </table> <p>Note: Students may be required to pass the final exam in order to be eligible to pass the course.</p>	a. Weekly Quizzes	0 - 20%	b. Term Tests	20 - 70%	c. Tutorials	0 - 10%	d. Participation/Attendance	0 - 5 %	e. Assignments	0 - 10%	f. Final Exam	30 - 40%
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<p><b>R:</b> Prior Learning Assessment and Recognition: specify whether course is open for PLAR</p> <p>None</p>												

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Course Designer(s)

Annie Marquise

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Education Council / Curriculum Committee Representative

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Dean / Director

Des Wilson

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Registrar

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