



EFFECTIVE: JANUARY 2006
CURRICULUM GUIDELINES

A. Division: Academic Division Effective Date: January 2006

B. Department / Program Area: Science & Technology/
 Mathematics

Revision New Course

If Revision, Section(s) Revised:
 Date of Previous Revision:
 Date of Current Revision:

C: MATH 1234 **D:** Mathematics for Liberal Arts **E:** 3

Subject & Course No.	Descriptive Title	Semester Credits						
<p>F: Calendar Description:</p> <p>Mathematics is everywhere. This one semester course for liberal arts students explores mathematics topics in order to improve quantitative reasoning and decision-making in everyday life, as well as to develop an appreciation for the power and beauty of the mathematics that is evident (and not so evident) in the world around us. Topics include: critical thinking and problem solving, percentages and number sense, uses and abuses of statistics, linear and exponential growth, and math in art and music. Good English writing and communications skills are recommended.</p>								
<p>G: Allocation of Contact Hours to Type of Instruction / Learning Settings</p> <p>Primary Methods of Instructional Delivery and/or Learning Settings:</p> <p>Lectures, group activities, group discussions</p> <p>Number of Contact Hours: (per week / semester for each descriptor)</p> <p style="text-align: center;">4</p> <p>Number of Weeks per Semester:</p> <p style="text-align: center;">15</p>	<p>H: Course Prerequisites:</p> <p>Principles of Math 11 C- (or an approved equivalent) OR Applications of Math 11 C OR DVST 0410 C</p> <p>I: Course Corequisites:</p> <p>J: Course for which this Course is a Prerequisite</p> <p>K: Maximum Class Size:</p> <p style="text-align: center;">28</p>							
<p>L: PLEASE INDICATE:</p> <table border="1" style="display: inline-table; vertical-align: top;"> <tr> <td style="width: 30px; height: 20px;"></td> <td>Non-Credit</td> </tr> <tr> <td style="width: 30px; height: 20px;"></td> <td>College Credit Non-Transfer</td> </tr> <tr> <td style="width: 30px; height: 20px; text-align: center;">X</td> <td>College Credit Transfer:</td> </tr> </table> <p style="text-align: center;">SEE BC TRANSFER GUIDE FOR TRANSFER DETAILS (www.bctransferguide.ca)</p>				Non-Credit		College Credit Non-Transfer	X	College Credit Transfer:
	Non-Credit							
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M: Course Objectives / Learning Outcomes

At the conclusion of this course students will be able to:

- identify and discuss at least three common misconceptions about mathematics
- understand and explain the importance of mathematical literacy in modern society
- reflect on the role that mathematics plays in their own lives

- recognize and analyze fallacies in given arguments
- use appropriate logic notation and simple truth tables to analyze the truth values of propositions involving negation, conjunctions, disjunctions, conditionals
- distinguish between inclusive and exclusive uses of the word “or”
- given a conditional, write its converse, its inverse and its contrapositive
- illustrate relationships between sets using Venn diagrams
- solve problems using Venn diagrams to organize information
- use Venn diagrams to test the validity of arguments
- distinguish between inductive and deductive arguments
- apply critical thinking strategies to analyze arguments

- know standard metric units of measurement
- perform unit conversions
- apply problem solving strategies to solve word problems
- solve percentage problems
- calculate absolute and relative change
- identify common abuses of percentages
- write and interpret numbers in scientific notation
- demonstrate number sense through estimation, comparison and scaling

- understand and interpret the 5 basic steps in a statistical study
- describe simple random sampling, systematic sampling, convenience sampling and stratified sampling
- distinguish between observational studies and experiments
- describe the placebo effect and the importance of blinding in experiments
- determine a confidence interval from a margin of error
- understand and apply guidelines for evaluating a statistical study
- interpret and create frequency tables, bar graphs, pie charts, histograms and line charts
- interpret graphs that relay statistical information
- distinguish between causation and correlation
- describe possible explanations for correlation
- understand and apply guidelines for recognizing causality

- explain the difference between linear and exponential growth
- calculate the doubling-time or half-life in given situations
- contrast exponential growth and logistic growth
- understand factors affecting carrying capacity
- understand and use the Richter scale, decibel scale, and pH scale

- understand the concept of a mathematical function
- given a real-life functional situation, identify dependent and independent variables, domain and range
- represent functions with tables, graphs and equations
- use functions given in the form of tables, graphs or equations to answer questions about real-life quantities

Depending on the sections covered by the instructor the students will also be able to:

ACCURACY AND PRECISION

- distinguish significant digits from non-significant zeros
- identify and distinguish between random and systematic errors
- calculate absolute and relative error
- distinguish between accuracy and precision
- apply rounding rules for combining approximate numbers

PROBABILITY AND COUNTING

- distinguish between theoretical, empirical and subjective probabilities
- calculate simple probabilities
- make a probability distribution
- calculate probabilities of the conjunction of independent and dependent events
- calculate probabilities of the disjunction of mutually exclusive and non-mutually exclusive events
- understand and apply the law of large numbers
- calculate and interpret expected values
- measure risk in terms of accident or death rates
- understand and interpret vital statistics and life expectancy
- calculate permutations and combinations
- determine the probability of winning a lottery

MORE ADVANCED LINEAR AND EXPONENTIAL MODELS

- calculate the slope of a linear function
- determine the equation of a line
- determine the equation of an exponential function

MATH IN MUSIC

- understand how a plucked string produces sound
- measure frequency and find harmonics of the frequency
- understand the musical scale and the ratios of frequencies among musical notes
- understand how the frequencies of a scale exhibit exponential growth
- explain the difference between analog and digital representations of music

MATH IN ART

- understand the use of perspective in painting
- find symmetries in paintings and tilings
- create tilings with regular or irregular polygons
- name several places that the golden ratio occurs in art and nature

MATH IN FINANCIAL MANAGEMENT

- know when and how to apply formulas for simple interest, compound interest and continuously compounded interest
- understand investment types: stocks, bonds, cash
- read financial tables for stocks, bonds and mutual funds
- use formulas appropriately to calculate total and annual returns
- understand the uses and dangers of credit cards
- understand considerations in choosing a mortgage
- use the loan payment formula to calculate payments
- calculate the total cost of a loan

N: Course Content:

1. Attitudes & Aptitudes: Why Math matters
2. Critical Thinking
3. Problem Solving
4. Units and Measurement
5. Percentage and Ratio
6. Statistical Reasoning
7. Linear vs. Exponential Growth
8. Intro to Modelling

PLUS at least 2 OF THE FOLLOWING (one of which must be Math in Music or Math in Art):

9. Accuracy and Precision
10. Probability
11. Linear and Exponential Modelling
12. Mathematics in Music
13. Math in Art
14. Math in Financial Management

O: Methods of Instruction

Lectures, group discussion, group activities

P: Textbooks and Materials to be Purchased by Students

Bennett, Jeffrey and Briggs, William. Using and Understanding Mathematics: A Quantitative Reasoning Approach, 3rd Edition, Pearson Education, Inc., 2005.

A basic scientific calculator that includes scientific notation, logarithms and exponential functions.

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. The assessments will be taken from the following options:

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|---------------------------------------|----------|
| a. Homework | 0 – 20% |
| b. Term Tests | 30 – 60% |
| c. Quizzes | 0 – 20% |
| d. Participation/In-class assignments | 10 – 20% |
| e. Term portfolio project | 0 – 30% |
| f. Term Paper | 0 – 20% |
| g. Final Exam | 0 – 30% |

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

Not open for PLAR.

Course Designer(s)

Susan Oesterle

Education Council / Curriculum Committee Representative

Dean / Director

Des Wilson

Registrar

Trish Angus