

# Evaluation Profile & Outline

2008 – 2009

Grade 12, University Preparation

Calculus and Vectors

MCV 4U



Earl Haig  
Secondary  
School

## Course Description/Rationale/Overview:

This course builds on students' previous experience with functions and their developing understanding of rates of change. Students will solve problems involving geometric and algebraic representations of vectors and representations of lines and planes in three-dimensional space; broaden their understanding of rates of change to include the derivatives of polynomial, sinusoidal, exponential, rational, and radical functions; and apply these concepts and skills to the modeling of real-world relationships. Students will also refine their use of the mathematical processes necessary for success in senior mathematics. This course is intended for students who choose to pursue careers in fields such as science, engineering, economics, and some areas of business, including those students who will be required to take a university-level calculus, linear algebra, or physics course.

## Class Requirements:

Calculator (scientific, not graphing)

Textbook : (supplied)

A deposit cheque in the amount of \$80, signed but not dated, is required when the text is issued. The cheque is to be made out to Earl Haig S.S.

Replacement textbook cost: \$80.00

## Course Requirements/Department Policies

Course Prerequisites: MHF4U

Arrangements for missed tests for valid reasons must be made ahead of time if known in advance, or the teacher must be contacted on the day of the test by phone (395-3210 ext. 20080) in case of illness or other unexpected absence. The student should be prepared to write the test immediately upon return to school.

Late assignments must be accompanied with a note signed by a parent or guardian stating the reason for late submission. The note must list the due date of the assignment and the actual date of submission.

If an assignment is handed in after it has been taken up/handed back, the student may not receive a mark for it.

## Assessment Strategies

Homework  
Tests  
Quizzes  
Assignments  
Examination

## Mathematical Process Expectations

Problem Solving  
Reasoning and Proving  
Reflecting  
Selecting Tools and Computational Strategies

Connecting  
Representing  
Communicating

## Achievement Categories and Weighting

Knowledge & Understanding	15% - 30%
Application	15% - 30%
Thinking	15% - 30%
Communication	15% - 30%

## Curriculum strands:

A. Rate of Change  
B. Derivatives and Their Applications  
C. Geometry and Algebra of Vectors

## Learning Skills:

- Works Independently
- Team work
- Organization
- Work Habits
- Initiative

## Evaluation

Quizzes & Assignments	15 %
Tests	55 %
Final Evaluation	30 %

Tests are written by all students on the same day and are designed so that students in different class sections will write tests of essentially equivalent difficulty.

Quizzes will be a regular feature of evaluation.

The final examination is compulsory.

## FINAL MARK

Year's Work:	70 %
Final Summative Evaluation	30 %



**A. Rate of Change**

1. Demonstrate an understanding of rate of change by making connections between average rate of change over an interval and instantaneous rate of change at a point, using the slopes of secants and tangents and the concept of the limit.
2. Graph the derivatives of polynomials, sinusoidal, and exponential functions, and make connections between the numeric, graphical, and algebraic representations of a function and its derivative.
3. Verify graphically and algebraically the rules for determining derivatives; apply these rules to determine the derivatives of polynomial, sinusoidal, exponential, rational and radical functions, and simple combinations of functions; and solve related problems.

**B. Derivatives and their Applications**

1. Make connections, graphically and algebraically, between the key features of a function and its first and second derivatives, and use the connections in curve sketching.
2. Solve problems, including optimization problems, that require the use of the concepts and procedures associated with the derivative, including problems arising from real-world applications and involving the development of mathematical models.

**C. Geometry and Algebra of Vectors**

1. Demonstrate an understanding of vectors in two-space and three-space by representing them algebraically and geometrically and by recognizing their applications.
2. Perform operations on vectors in two-space and three-space, and use the properties of these operations to solve problems, including those arising from real-world applications.
3. Distinguish between the geometric representations of a single linear equation or a system of two linear equations in two-space and three-space, and determine different geometric configurations of lines and planes in three-space.
4. Represent lines and planes using scalar, vector, and parametric equations, and solve problems involving distances and intersections.