



Calculus and Vectors - Grade 12 University

MCV 4UI

Course web page: <http://teachers.wrdsb.ca/reinhart/mcv4ui/>

Edmodo: <http://www.edmodo.com>

Ministry Guideline: The Ontario Curriculum, Grades 11 and 12 (Revised 2007)

Course Description/Rationale

This course builds on students' previous experience with functions and their developing understanding of rates 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 process 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.

Overall Expectations of the Course

By the end of this course, students will:

- 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;
- graph the derivatives of polynomial, sinusoidal, and exponential functions, and make connections between the numeric, graphical, and algebraic representations of a function and its derivative;
- 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;
- 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;
- 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;
- demonstrate an understanding of vectors in two-space and three-space by representing them algebraically and geometrically and by recognizing their applications;
- 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;
- 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;
- represent lines and planes using scalar, vector, and parametric equations, and solve problems involving distances and intersections.

Unit Number	Title	Approximate Number of Periods
1	Derivatives	13
2	Curve Sketching	13
3	Applications of Derivatives	10
4	Logs & Exponentials	10
5	Trigonometry	10
6	Vectors	8
7	Algebraic Vectors	8
8	Lines in a Plane	8
9	Equations of Planes	8

Required Supplies

Please bring the following to class with you **EVERY DAY**: textbook, scientific calculator, pencil, eraser, lined paper, binder, and a ruler.

Possible Assessment/Evaluation Techniques

- Quizzes and tests
- Assignments or written reports
- Ongoing classroom observations of daily activities

Mark Breakdown

According to the new curriculum initiatives, the breakdown of marks is to be as follows:

Term Work (Each Unit → Tests 70%, Quizzes: 15%, Assignments: 15%) + Midterm 5%	70%
Final Year-ending Assignments (Summative 5%, Exam 25%)	<u>30%</u>
Total	<u>100%</u>

According to the curriculum guidelines, your child will be assessed and evaluated using the following categories:

- *Knowledge/Understanding* → understanding concepts and performing algorithms
- *Thinking/Inquiry/Problem Solving* → reasoning and applying the steps of an inquiry/problem solving process
- *Communication* → communicating reasoning both orally and in writing, as well as proper use of mathematical language and symbols
- *Application* → applying concepts and procedures relating to familiar and unfamiliar settings

ECI Missed Work Policy:

It is expected that students complete all assigned work in a timely manner. Students who are absent on the day of an assessment (e.g. test or presentation) or when an assignment is due, must speak with their teacher when they return to make arrangements to complete the required work. Whenever possible, students will inform their teacher in advance of their absence.

Each assessment will have a final date of submission after which it will no longer be graded. This date will be clearly communicated to students by the teacher. Work that has not been submitted by the final due date will be deemed "incomplete" for the purposes of grade reporting. Failure to complete all required work will negatively impact a student's final grade, and may prevent successful attainment of the credit.

In addition, students who do not submit work in a timely manner should expect to have this reflected in the Learning Skills and comments sections of the report card.

Calculus and Vectors - Grade 12 University
MCV 4UI

Please sign and return this form by Friday, February 8, 2019.

The following signatures indicate that I have read and understand the course outline.

Student Name (please print) _____

Student Signature _____ Date _____

Parent Name (please print) _____

Parent Signature _____ Date _____

Home Phone #: _____

Parent's e-mail address: _____