Course: MCV 4U	**Teacher: Clement**	**Program Leader: Marchildon**
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Course Description:
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 modelling 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.

Big Ideas (overall learning outcomes for the course):
- The derivative is an efficient and effective tool to solve many types of problems (real or abstract).
- Algebraic and Geometric vectors can be used to model the world around us which in turn allows us to solve problems and make educated predictions.

Overall Curriculum Expectations:

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.

Instructional Strategies:
Westside teaching staff will use a variety of instructional strategies to help students develop and improve skills in the following areas: character, citizenship, communication, critical thinking and problem solving, collaboration and teamwork, and creativity and imagination.

Assessment and Evaluation:
Formative assessments are used to improve student learning by providing varied opportunities to demonstrate an understanding of course expectations in preparation for summative evaluations. Students will have the opportunity to complete mastery quizzes throughout each unit which may lead to a reduced summative assessment. Summative evaluations test groups of key expectations. Failure to complete a summative evaluation may result in the expectations of the course not being met and the credit not being granted.

The following soft skills will be assessed:
Responsibility, Organization, Independent Work, Collaboration, Initiative, Self-Regulation

More details about Westside's Assessment and Evaluation Policy is available at:
http://www.ugdsb.ca/westside/wp-content/uploads/sites/74/2016/12/Westside-Assessment.pdf

Achievement Categories:	
Student learning is assessed and evaluated with respect to the following four categories of knowledge and skills.	**Knowledge and Understanding:** 25% **Thinking:** 25% **Communication:** 25% **Application:** 25%

	Term Work (70%)
Unit of Study	**Summative Evaluations**
Calculus	3 Tests Graphs of Derivatives Assessment Optimization Assessment
Calculus Midterm	Paper & Pencil Test (15%)
Algebraic and Geometric Vectors	Paper & Pencil Test (2 parts)
Lines & Planes as Vectors	Paper & Pencil Test (2 parts)
	Final Summative (30%)
Curve Sketch	Completed in final weeks of the course (10%)
Vectors Final Exam	completed on exam day(20%)

Course Materials and Replacement Cost

Textbook: Calculus and Vectors (Nelson)   Cost: $90

Additional Costs

Trip to University of Guelph - $5

Late Policy

Students are expected to complete all assigned work and submit it by the teacher's established due date. Every attempt will be made to encourage students to complete all assigned work on time so their grade represents their actual achievement. For late and missed summative assessments, please see the ***Westside Students' Contract for Missing Evidence of Learning***.

Student Expectations

Every student enrolled in Mathematics at Westside is expected to:
- be prepared for class each and every day. This means you bring a writing utensil, calculator and paper with you to class
- actively participate in class discussions
- be on time to class
- complete homework assigned
- learn to problem solve using the techniques you will learn in class

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Final Assessments/Examinations

Culminating activities for each unit must be completed by the student in order to achieve the credit. Failure to complete any one of them may result in loss of credit.

There are no extensions or exemptions for final assessments without the approval from an administrator.