Course of Study

1. Course Details

Lawrence Park C.I **TDSB**	**Teacher(s) : Chi Ho, David Lam, and Kevin Thomas** **Faculty : Mathematics** **Faculty Office Phone : 416-393-9500 Ext 20080** **Name of ACL : Chi Ho** **ACL Contact : ChiKin.Ho@tdsb.on.ca** **Textbooks : Calculus and Vectors by Nelson**	**Date revised : September 2019** **Course Name : Calculus and Vectors, Grade 12** **Course Code : MCV4U** **Prerequisite/ Corequisite Course Code : MHF4U** **Credit Value : 1** **Essential Resource Materials : Scientific calculator**

2. Overall Goals

Overall Expectations:

Rate of Change

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 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 the 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.

Derivatives and their Applications

By the end of this course, students will:

- 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.

Geometry and Algebra of Vectors

By the end of this course, students will:

- 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.

3. Learning Skills and Work Habits

Evaluated on Report Card as:
E (excellent); G (good); S (satisfactory); N (needs improvement)

The Learning Skills demonstrated by a student in every course are evaluated in the following six categories: Responsibility, Organization, Independent Work, Collaboration, Initiative, and Self-regulation. The Learning Skills are evaluated using a four-point scale. The goal for each student is to improve Learning Skills which will translate into improved student's overall success.

In addition, completion of the assigned homework/assignments on time will contribute to student's success. We also know that regular attendance in all classes is essential for success; please avoid scheduling appointments during school time.

Students are expected to demonstrate academic honesty on all assignments, presentations, tests, and examinations. Student who cheat or plagiarize will receive a mark of zero for the assignment, presentation, test, or examination.

Responsibility	The student: • fulfils responsibilities and commitments within the learning environment; • completes and submits class work, homework, and assignments according to agreed-upon timelines; • takes responsibility for and manages own behaviour.
Organization	The student: • devises and follows a plan and process for completing work and tasks; • establishes priorities and manages time to complete tasks and achieve goals; • identifies, gathers, evaluates, and uses information, technology, and resources to complete tasks.
Independent Work	The student: • independently monitors, assesses, and revises plans to complete tasks and meet goals; • uses class time appropriately to complete tasks; • follows instructions with minimal supervision.
Collaboration	The student: • accepts various roles and an equitable share of work in a group; • responds positively to the ideas, opinions, values, and traditions of others; • builds healthy peer-to-peer relationships through personal and media-assisted interactions; • works with others to resolve conflicts and build consensus to achieve group goals; • shares information, resources, expertise and promotes critical thinking to solve problems and make decisions.
Initiative	The student: • looks for and acts on new ideas and opportunities for learning; • demonstrates the capacity for innovation and a willingness to take risks; • demonstrates curiosity and interest in learning; • approaches new tasks with a positive attitude; • recognizes and advocates appropriately for the rights of self and others.
Self-regulation	The student: • sets own individual goals and monitors progress towards achieving them • seeks clarification or assistance when needed • assesses and reflects critically on own strengths, needs, and interests; • identifies learning opportunities, choices, and strategies to meet personal goals.

4. Teaching/Assessment and Evaluation Strategies - Course Work (70%)

Students will demonstrate achievement of all the overall expectations of the course. Missed and/or incomplete assignments will have an impact on the final grade where there are a significant number of curriculum expectations that have not been evaluated because of missed assignments. Timelines and units may be adjusted to accommodate student needs.

Unit #	Culminating Tasks	Achievement Chart Focus (All culminating tasks include knowledge/understanding, thinking, communication, and application categories.)	Time Line: No. of periods
1	Test	An Introduction to Calculus	8
2	Test	Derivatives	9
3	Test	Derivatives and their Applications	9
4	Test	Curve Sketching	9
5	Test	Derivatives of Exponential and Trigonometric Functions	9
6	Test	An Introduction to Vectors	10
7	Test	Applications of Vectors	9
8	Test	Equations of Lines and Planes	9
9	Test	Relationships between Points, Lines and Planes	6

4. Teaching/Assessment and Evaluation Strategies - Final Evaluation (30%)

All Students must take part in the culminating activities for each course at every grade level of study

Summative Tasks	Achievement Chart Focus	Weighting
• Final exam on Calculus	• All topics in Calculus and Vectors	• 30 %

5. Achievement Chart

Achievement Categories For Course Work	Description	Weighting
Knowledge/Understanding	- knowledge of facts and terms - understanding concepts, principles, and theories - understanding of relationships between concepts	**35 %**
Thinking	- critical thinking skills (analyzing, detecting bias) - creative thinking (problem solving) - inquiry skills (formulating questions; conducting research; analyzing, interpreting and evaluating information; drawing conclusions)	**15 %**
Communication	- communication of information and ideas - use of visuals and technology - multimedia - oral communication (debates, discussions, listening skills, role-playing) - written communication (short essays, writing in role)	**15 %**
Application	- application of concepts, skills, and procedures - transfer of concepts, skills, and procedures to new ideas - making logical conclusions or generalizations - making predictions and planning courses of action - making connections	**35 %**

6. Term Grades for Provincial Reports

Term Grades for Provincial Reports throughout the Year

The grade for each term/reporting period is based on the evaluations that have been conducted to that point in the course and will be preliminary and tentative. They will be based on the most consistent level of achievement to that point in time, but some of the overall expectations, strands, and units will not have been addressed. The students' grades will most likely change when the students' entire work is evaluated by the end of the course.

Reporting cycle 1: September 3rd—November 5th (Report Card: November 14th)
Reporting cycle 2: November 6th—January 24th (Report Card: February 7th)
Reporting cycle 3: January 25th—March 31st (Report Card: April 9th)
Reporting cycle 4: April 1st—June 22nd (Final Report Card pick up: June 25th)

Exam Review Day: June 22nd (9-11 am only)

7. Communication

In addition to class time, students can receive additional assistance from:

- Subject teachers before/after school, during lunch hour or by appointment.