Bishop Macdonell Catholic High School

COURSE OVERVIEW

COURSE TITLE: **Calculus and Vectors**, Grade 12, University Preparation

COURSE CODE: MCV 4U1

CREDIT VALUE: 1.0

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 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.

HOW THIS COURSE SUPPORTS THE ONTARIO CATHOLIC GRADUATE EXPECTATIONS:
The mind and its capacity for rational analysis are seen as gifts from God to be used and enjoyed. The training of the intellect ensures that all knowledge can be scrutinized and the divine and the human more deeply understood. In this sense, knowledge is illuminated with the light of faith. In Catholic education, the commitment to maturity of mind and academic excellence is always in reference to God's revealed wisdom as to life's purpose and meaning.
This course encourages the Catholic learner to develop his/her God-given gifts and abilities to promote growth toward personal responsibility in preparation for a chosen career path. Emphasis should be placed on moral, ethical, and realistic decision-making in an effort to build responsible citizenship. The classroom environment should instill a spirit of cooperation among students, rather than competition, and should foster a collaborative sense of community. This course provides many opportunities for students to work effectively as interdependent team members and to respect others for their opinions.

UNIT TITLES: (Approximate Time and Sequence)

Unit 1	Rates of Change and Limits	11 periods
Unit 2	Derivative Rules	11 periods
Unit 3	Curve Sketching and Optimization	12 periods
Unit 4	Derivatives of Sinusoidal Functions	8 periods
Unit 5	The Logarithmic Function and Derivatives of Exponential Functions	8 periods
Unit 6	Geometric and Cartesian Vectors	14 periods
Unit 7	Representing Lines and Planes	14 periods

ASSESSMENT and EVALUATION:

COURSE GRADE WEIGHTING:	**CATEGORY WEIGHTING**:
Term Work 70%	Knowledge and Understanding 30%
Final Assessment 30%	Application 30%
	Thinking 20%
	Communication 20%

Students will be assessed using a variety of techniques including: formative and summative quizzes, summative unit tests, assignments, investigations, and a formal final exam.

LATE AND MISSED ASSIGNMENTS:
Students are expected to complete <u>all</u> evaluation activities. Special considerations for late or missed assignments will only be given for **legitimate reasons**. Examples of legitimate reasons include sickness (**ONLY if confirmed ahead of the assessment date**) or family emergencies. A doctor's note may be required.
- If you are sick and are missing a test you must confirm your absence before the start of class.
- If you are at school for part of the day but are going home sick, you must still hand in your assignments before you leave, and if it is a test day then you must speak with your teacher before you go home.

Considerations
1. If the evaluation was done during class time, the student will be given an opportunity to complete the activity at a mutually agreed upon time.
2. If the evaluation was required to be submitted on a due date, an extension will be granted to the student, the length of which will be determined by the teacher.
3. If a student has been excused from class due to a school function, considerations will only be given if prior discussion has occurred with the teacher. Always communicate with your teacher, don't assume they know which activities you are involved with and what your schedules are for those activities.

Non-Legitimate Reasons
When a student fails to complete an assessment or evaluation activity because of a non-legitimate reason, an "M" will be recorded in the teacher records indicating that the activity was missed. Examples of non-legitimate reasons include skipping class on the date that an evaluation is done or required to be submitted, not confirming an absence ahead of time, or failing to complete assignments because of poor time management skills. Failure to complete assessment and evaluation activities reduces the body of evidence upon which the teacher can evaluate student achievement of curriculum expectations and could jeopardize the granting of a credit for the course.

Please do not leave your studying and assignment completion to the last minute...always plan ahead!

ACADEMIC HONESTY:
Academic honesty is expected of all students. In accordance with the Ontario Catholic School Graduate Expectations, a student will:
√ Achieve excellence, originality and integrity in one's own work and support these qualities in the work of others.
√ Respect the rights, responsibilities and contributions of self and others.

Cheating is the direct attempt to use another's work as one's own, and act of deliberate dishonesty. Plagiarism is a form of cheating that is a serious legal, unethical and academic offense, be it intentional or unintentional. Students have the responsibility to ensure that all work submitted is their own or appropriately attributed to its source. Responses to academic dishonesty may include:
a) Repeating the assignment
b) Completing an alternative assignment
c) Mark reduction
d) Mark of zero

GENERAL COURSE INFORMATION:
- Learning Skills: regular attendance, working independently, teamwork, organization, work habits, initiative, risk-taking, time management, perseverance, curiosity and a love of learning are all essential to success in this course.
- A scientific calculator, graph paper, pens, pencils, a ruler and a memory stick are required for this course.

- Textbook #: _____. **Replacement cost for a lost textbook is $85.00**.

APPROPRIATE USE OF GRAPHING CALCULATORS:

Students will be provided with graphing calculators to be used at school only. In keeping with Board Policy on Telecommunications: Any malicious attempt to harm or destroy the calculator is prohibited and may result in financial compensation and/or other disciplinary action consistent with the School Code of Behaviour, Board Policy and/or the Education Act. Likewise, **theft or loss, through negligence, of the calculator will result in a cost replacement by the student/parents of $150.00**.

ASSESSMENT RESULTS:

Each student is asked to keep **ALL** quizzes, tests and assignments neatly organized in their notebooks, and to make any necessary corrections. This can be one way for students to keep track of their progress in the course. All solutions will be posted in the classroom so please make sure you make the necessary corrections.

WEBSITE:
There is a class website where you will find class information such as our weekly schedule, announcements, unit planners, online resources and copies of the handouts and notes from class. I strongly suggest you visit the site daily!

The website is www.petrinmath.weebly.com and the **password** is _____.

TEACHER CONTACT INFORMATION:

If you have any questions or concerns please contact Mrs. Petrin at the school.

      Work Phone #:   (519) 822-8502 ext. 235

      Email: lisanne.petrin@wellingtoncdsb.ca

PARENT/GUARDIAN/STUDENT SIGNATURE:

My signature below indicates that I have read and understood the course overview.

      Student Signature: _____   Date: _____

      Parent/Guardian Signature: _____   Date: _____

This course overview document must be kept in the student's notebook.

MCV 4U: Calculus and Vectors, Grade 12 University Preparation

Unit		Expectations	Textbook
Unit 1	Rates of Change and Limits	*A1. 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 a limit.*	Chapter 1
Unit 2	Derivative Rules	*A3. Verify graphically and algebraically the rules for determining derivatives; apply these rules to determine the derivatives of polynomial, rational, and radical functions, and simple combinations of functions; and solve related problems.*	Chapter 2
Unit 3	Curve Sketching and Optimization	*B1. 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.* *B2. 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.*	Chapter 3
Unit 4	Derivatives of Sinusoidal Functions	*A2. Graph the derivatives of sinusoidal functions, and make connections between the numeric, graphical, and algebraic representations of a function and its derivatives.* *A3. Verify graphically and algebraically the rules for determining derivatives; apply these rules to determine the derivatives of sinusoidal functions, and simple combinations of functions; and solve related problems.*	Chapter 4
Unit 5	The Logarithmic Function and Derivatives of Exponential Functions	*A2. Graph the derivatives of exponential functions, and make connections between the numeric, graphical, and algebraic representations of a function and its derivatives.* *A3. Verify graphically and algebraically the rules for determining derivatives; apply these rules to determine the derivatives of exponential functions, and simple combinations of functions; and solve related problems.*	Chapter 5
Unit 6	Geometric and Cartesian Vectors	*C1. Demonstrate an understanding of vectors in two-space and three-space by representing them algebraically and geometrically and by recognizing their applications.* *C2. 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.*	Chapters 6, 7
Unit 7	Representing Lines and Planes	*C3. 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.* *C4. Represent lines and planes using scalar, vector, and parametric equations, and solve problems involving distances and intersections.*	Chapter 8

From: The Ontario Curriculum, Mathematics, Grades 11 and 12. MCV 4U: pages 99-110.