

## **Calculus and Vectors – (MCV4U) // AP Calculus**

**Ministry 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 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.

Further to the Ministry requirements, students will prepare for the Calculus AB exam to be written in the spring by covering integration and related topics as outlined below. These topics will not be evaluated as part of the MCV4U course, but will be practiced through on-line AP Board resources.

**Prerequisite:** MHF4U2

### ***Units of Study***

- Unit 1: Geometric and Algebraic Vectors and their Applications (2-3 weeks)
- Unit 2: Lines and Planes in 2D and 3D space (2-3 weeks)
- Unit 3: Limits and Continuity (1-2 weeks) \*much of this will simply be review as it was covered in MHF4U2
- Unit 4: Derivatives (2-3 weeks)
- Unit 5: Related Rates and Optimization (2-3 weeks)
- Unit 6: Curve Sketching (1-2 weeks)  
\*\*\*MCV4U is completed at this point. The 70% term work will be based on the evaluations covered. The Final Exam will be based on curriculum covered to this point.
- Unit 7: Integrals and the Fundamental Theorem of Calculus (3-4 weeks)

### ***Course Evaluation***

- Term Work: 70%
- Final Examination: 30%

### ***Learning Categories***

Within each evaluation component, the following learning categories will be weighted as follows:

- Knowledge & Understanding 30%
- Communication 20%
- Application 30%
- Thinking 20%

Sufficient notice will be given for major evaluations (Quizzes may be announced day prior). As such, students will provide sufficient notice of missing an evaluation for a legitimate reason. Missing an evaluation will be verified with the student's parent/guardian. Any evaluation missed due to truancy will be assigned a 0%.