

**ST. JOSEPH CATHOLIC SECONDARY SCHOOL**  
**COURSE OUTLINE**



**Calculus and Vectors / MCV4U**

**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.

**Course Prerequisite MHF4U**

**Units of Study**

Unit 1	<i>Introduction to Calculus / Limits</i>
Unit 2	<i>Derivatives / Derivative Rules</i>
Unit 3	<i>Derivatives of Functions</i>
Unit 4	<i>Applications of Derivatives</i>

**Catholic Graduate Expectations:** The mind and its capacity for rational analysis are seen as gifts from the Creator 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.

Unit 5	<i>Geometric Vectors</i>
Unit 6	<i>Algebraic Vectors</i>
Unit 7	<i>Equations of Lines and Planes</i>
Unit 8	<i>Relationships Between Points, Lines, and Planes</i>

**Evaluation**

70%	30%
Knowledge/Understanding	Culminating Task and Exam
Thinking/Inquiry	
Communication	

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Application	
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**Course Resources Required:**

Paper  
Pencils/erasers  
Scientific Calculator  
Textbook (provided)

For a detailed course description of this course, please visit  
<https://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.htm>