SOUTH CARLETON HIGH SCHOOL
Ottawa-Carleton District School Board
STUDENT OUTLINE
MCV4U
CALCULUS AND VECTORS
UNIVERSITY

Credit Value: 1 credit	Hours: 110	Prerequisite: MHF4U

Expectations

This course builds on students' previous experiences 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 3-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 are required to take a university-level calculus, linear algebra or physics course.

Course Expectations

Strand	Overall Expectations
Rate of Change	Demonstrate an understanding of rate of change by making connections between average and instantaneous rate of change, using the slope 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 / 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.
Derivatives and their Applications	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 types, 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	Demonstrate an understanding of vectors in 2-space and 3-space by representing them algebraically and geometrically and by recognizing their application; perform operations on vectors in 2- and 3-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 2 linear equations in 2- and 3-space, and determine different geometric configurations of lines and planes in 3-space; and represent lines and planes using scalar, vector and parametric equations ; and solve problems involving distances and intersections.

Accommodations for Exceptional Students

The Mathematics department makes every effort to accommodate the identified needs of exceptional (IPRC'd) students and will attempt to differentiate curriculum delivery methods, student modes of expression, and assessment methods as recommended by the student's individual education plan (IEP).

Career Planning

The Mathematics department makes every effort to ensure students are aware of career opportunities related to various fields of Mathematics. In particular, the teacher will help the student to be aware of "real world" applications of the topics presented in this course.

Technology and Textbooks

Students will have the opportunity to use available software in Mathematics appropriate to the course including software packages: Zap-a-Graph, MathTrek and Geometer's Sketchpad. Graphing calculators will also be available to the students.

Calculator	Each student requires a *scientific calculator* that will be used on a daily basis. Graphing calculators will be supplied when required.
Resources	*Calculus and Vectors*, Nelson

Evaluation

Term reports	Final Report	
Students will be evaluated on the overall expectations listed above. Evaluations will cover a balance of Knowledge & Understanding, Application, Communication, Thinking, Inquiry and Problem Solving.	Term Summative Evaluation Final Exam	70% 10% 20% **100%**
Assessment tools include tests/quizzes, assignments, performance tasks and rich assessment tasks		

More information on South Carleton High School's policy on Assessment and Evaluation and on Academic Integrity can be accessed on our school website.

Please see **Student Planner** for policies on punctuality, absenteeism and examinations, and other student responsibilities.