

# MATHEMATICS

## GRADE 12

### COURSE DESCRIPTIONS

#### **Advanced Functions, University**

**MHF4U**

This course extends students' experience with functions. Students will investigate the properties of polynomial, rational, logarithmic, and trigonometric functions; develop techniques for combining functions; broaden their understanding of rates of change; and develop facility in applying these concepts and skills. Students will also refine their use of the mathematical processes necessary for success in senior mathematics. This course is intended both for students taking the Calculus and Vectors course as a prerequisite for a university program and for those wishing to consolidate their understanding of mathematics before proceeding to any one of a variety of university programs.

**Prerequisite:** MCR3U, Functions

#### **Calculus and Vectors, University**

**MCV4U**

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.

**Note: The new Advanced Functions course (MHF4U) must be taken prior to or concurrently with Calculus and Vectors**

#### **Data Management, University**

**MDM4U**

This course broadens students' understanding of mathematics as it relates to managing data. Students will apply methods for organizing and analyzing large amounts of information; solve problems involving probability and statistics; and carry out a culminating investigation that integrates statistical concepts and skills. Students will also refine their use of the mathematical processes necessary for success in senior mathematics. Students planning to enter university programs in business, the social sciences, and the humanities will find this course of particular interest.

**Prerequisite:** MCR3U or MCF3M

**Math for College Technology, College****MCT4C**

This course equips students with the mathematical knowledge and skills needed for entry into college technology programs. Students will investigate and apply properties of polynomial, exponential, and logarithmic functions; solve problems involving inverse proportionality; and explore the properties of reciprocal functions. They will also analyse models of a variety of functions, solve problems involving piecewise-defined functions, solve linear-quadratic systems, and consolidate key manipulation and communication skills. **Students entering mathematics-focused programs at the college level benefit from MCT4C.** This course enables students to consolidate and expand many pre-calculus concepts explored in previous mathematics courses. Contextual applications and technological tools are integrated throughout to support the development of new skills and the exploration of a variety of mathematical models.

**Prerequisite: MCR3U or MCF3M**

**College and Apprenticeship Math, College****MAP4C**

This course enables students to broaden their understanding of real-world applications of mathematics. Students will analyse data using statistical methods; solve problems involving applications of geometry and trigonometry; solve financial problems connected with annuities, budgets, and renting or owning accommodation; simplify expressions; and solve equations. Students will reason mathematically and communicate their thinking as they solve multi-step problems. This course prepares students for college programs in areas such as business, health sciences, and human services, and for certain skilled trades.

**Prerequisites: MCR3U, MCF3M or MBF3C**

**Mathematics for Everyday Life, Workplace****MEL3E**

This course enables students to broaden their understanding of mathematics as it is applied in important areas of day-to-day living. Students will use statistics in investigating questions of interest and apply principles of probability in familiar situations. They will also investigate accommodation costs and create household budgets; solve problems involving estimation and measurement; and apply concepts of geometry in the creation of design.

**Prerequisite: MEL3E**