

STUDENT FRIENDLY COURSE DESCRIPTIONS – MATHEMATICS

GRADE 9

Locally Developed Compulsory Course, Grade 9

MAT 1L

Learn the math you need to survive in the adult world.

If math has always been a struggle, but you need to learn the basic math skills that are necessary to cope in the future, this course will help you.

In this course students will learn about:

- practical applications of money, for example, calculating taxes, discounts, and tips
- estimating and measuring using the metric and imperial systems
- fractions, rates, and ratios through the themes of cooking, sports and leisure and construction
- drawing 3-D shapes and finding the volumes
- the world of work and how to calculate salaries

Students will be working in partners or groups. There will be lots of opportunities for hands-on learning using imitation money, measuring cups and spoons, several different types of linear measurement tools, technology, and other mathematical manipulatives. The assignments and projects are related to real life scenarios.

Prerequisite: None

Foundations of Mathematics, Grade 9 – Applied

MFM 1P

This course will expose students to a variety of mathematical processes and their applications.

Students will:

- review ratios, rates, proportions, and percents, and solve problems using proportional reasoning
- be introduced to algebra and learn the procedures involved in simplifying mathematical expressions involving variables, and solving equations
- explore the characteristics of linear relations and learn how to communicate the relationship between two variables using graphs, equations, tables and word descriptions
- review concepts related to perimeter, area, and volume, and solve problems involving both 2-dimensional and 3-dimensional shapes
- explore the angle patterns present in 2-dimensional figures such as triangles and quadrilaterals in addition to the angle relationships formed between parallel lines.

Throughout this course students will be taught and expected to use their scientific calculators effectively. Students will be using hands-on manipulatives to explore math concepts and they will be working on mathematical investigations in pairs or small groups. At the conclusion of the course, students must write the Grade 9 EQAO math test, which will be counted in the final grade.

Prerequisite: None

Principles of Mathematics, Grade 9 – Academic MPM 1D

In this course students will:

- learn the exponent rules, how to simplify algebraic expressions and solve linear equations
- explore the characteristics of linear relations and learn how to communicate the relationship between two variables using graphs, equations, tables, and word descriptions
- learn about the vertical-intercept and slope of a linear relationship
- solve problems involving linear relations
- review concepts related perimeter, area, volume and surface area, and solve problems involving both 2-dimensional and 3-dimensional shapes
- explore the angle patterns present in 2-dimensional figures such as triangle and quadrilaterals in addition to the relationship of the angles formed between parallel lines

Throughout the course students will be taught and expected to use both their personal scientific calculators, and the TI NSpire graphing calculators; the TI NSpire calculators will be provided for in class use only. They will be exposed to a variety of mathematical processes and their application. They will be working in partners or small groups on mathematical investigations, many that require the use of technology. At the end of the course, the students must write the Grade 9 EQAO math test, which will be counted in the final grade.

Prerequisite: None

GRADE 10

Locally Developed Compulsory Course, Grade 10 MAT 2L

In this course, students will learn about:

- the practical applications of money, for example, calculating taxes and discounts, estimating tips, and answering questions about wages
- measurements and converting within the metric and imperial systems, estimating lengths using real world objects as references and how to determine the time across different time zones
- unit rates, such as how much one item costs if you buy a group of items at a particular price in order to determine whether or not you are getting a deal
- ratios and how they can be used in activities such as cooking or planning an event

Students will be working in partners or groups. There will be lots of opportunities for hands-on learning using imitation money, measuring cups and spoons, several different types of linear measurement tools, technology, and other mathematical manipulatives. The assignments and projects are related to real life scenarios.

Prerequisite: A grade 9 math credit or approval from school official

Foundations of Mathematics, Grade 10 – Applied

MFM 2P

This course helps students:

- develop a better understanding of linear relations, including determining the point of intersection between two non-parallel lines
- graph quadratic equations and analyze graphs of quadratic relations
- investigate similar triangles, and use trigonometry to determine missing measures in right angled triangles
- review the formulas for calculating the volume of 3-dimensional figures and develop the formulas for calculating their surface area
- solve problems that require using the skills taught in the four above content areas

Student will extend their skills from Grade 9 through investigations, the effective use of technology, and hands on activities. Students will consolidate their mathematical skills as they solve problems and communicate using proper mathematical terminology. Throughout the course, students will be taught and expected to use their calculators effectively.

Prerequisite: Foundations of Mathematics, Grade 9, Applied (MFM 1P) OR Principles of Mathematics, Grade 9, Academic (MPM 1D)

Principles of Mathematics, Grade 10 – Academic

MPM 2D

This course helps students to:

- develop a better understanding of linear relations
- determine the point of intersection between two non-parallel lines both graphically and using algebra
- verify several properties of triangles and quadrilaterals
- explore the properties of quadratic equations and analyze their graphs and equations
- investigate similar triangles, and use trigonometry to determine missing measures in triangles
- solve problems that require using the skills taught in the content areas mentioned above

Students will extend their skills from Grade 9 through investigations and the effective use of technology. Students will consolidate their mathematical skills as they solve problems and communicate using proper mathematical terminology. Throughout the course, students will be taught and expected to use their calculators effectively.

Prerequisite: Principles of Mathematics, Grade 9, Academic (MPM 1D)

GRADE 11

Mathematics for Work and Everyday Life, Grade 11 – Workplace Preparation

MEL 3E

This course enables students to broaden their understanding of mathematics as it is applied in the workplace and daily life. Students will:

- solve problems that deal with earning money, paying taxes, and making purchases
- learn financial math involved in saving, investing, and borrowing money
- calculate the costs involved in owning a vehicle of transportation and compare various modes of transportation

Students will strengthen their mathematical skills as they solve many problems and share their thinking in class. Assignments and/or projects will be based on real life scenarios.

Prerequisite: Any grade 9 and/or grade 10 math credit

Foundations of College Mathematics, Grade 11 – College Preparation

MBF 3C

This course enables students to broaden their understanding of mathematics as a problem solving tool in the real world. Students will:

- learn more about quadratic relations
- investigate situations involving exponential growth
- solve problems involving compound interest
- solve financial problems involving owning a vehicle
- develop their ability to reason by collecting, analysing, and evaluating data
- calculate and interpret information using probability
- solve problems in 3 dimensional geometry and trigonometry

Students will strengthen their mathematical skills as they solve problems and communicate their thinking. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning.

Prerequisite: Grade 10, Foundations of Mathematics (MFM 2P)

Functions and Applications, Grade 11 – College/University Preparation

MCF 3M

In this course, students will:

- be introduced to basic features of the function by extending their experiences with quadratic relations
- focus on quadratic, trigonometric, and exponential functions and in modelling these functions in real-world situations
- represent functions numerically, graphically, and algebraically
- simplify expressions
- solve equations
- solve problems relating to applications

Students will be expected to reason mathematically and communicate their thinking clearly as they solve multi-step problems. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning.

Prerequisite: Principles of Mathematics, Grade 10, Academic (MPM 2D) or Foundations of Mathematics, Grade 10, Applied with at least 80% average (MFM 2P)

Functions, Grade 11 – University Preparation

MCR 3U

After learning about linear relations in grade 9 and Quadratic Relations in grade 10, this course continues to expose students to other non-linear relations. The students will:

- learn about other relations and functions
- investigate properties of functions, including trigonometric and exponential functions and they will learn how to represent these functions numerically, algebraically, and graphically
- solve problems involving applications of functions
- investigate inverse functions
- continue to refine their ability to develop equivalent algebraic expressions, specifically with polynomial, radical, and rational expressions
- solve financial problems arising from applications of various types of sequences and series

At this level, students will need to reason mathematically and communicate their thinking clearly as they solve multi-step problems. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning.

Prerequisite: Principles of Mathematics, Grade 10, Academic (MPM 2D)
Functions and Applications, Grade 11, University/College Preparation (MCF 3M)

GRADE 12

Mathematics for Work and Everyday Life, Grade 12 – Workplace Preparation

MEL 4E

This course enables students to broaden their understanding of mathematics as it is applied in the workplace and daily life. Students will:

- learn how to organize, represent and make inferences from data
- become familiar with the concept of probability
- learn about personal finance including the process of filing a personal tax return, comparing various accommodation costs, and how to create and adjust personal and family budgets
- estimate, measure and convert measurements in both the metric and imperial systems
- apply proportional reasoning to solve problems involving scale drawings and scale models
- calculate the costs involved in owning a vehicle of transportation and compare various modes of transportation

Students will strengthen their mathematical skills as they solve many problems and share their thinking in class. Assignments and/or projects will be based on real life scenarios.

Prerequisite: Mathematics for Work and Everyday Life, Grade 11, Workplace Preparation (MEL 3E)

Foundations for college Mathematics, Grade 12 – College Preparation

MAP 4C

This course enables students to broaden their understanding of real-world applications of mathematics. Students will:

- continue to develop skills needed to simplify algebraic expressions involving exponents and solve problems involving exponential equations
- become more familiar with the vocabulary used to describe and compare graphs, and their trends
- continue to solve problems involving linear, quadratic, and exponential functions
- be introduced to several concepts involved in personal finance such as mortgages and annuities, costs associated with owning and renting accommodation, and design and adjust personal and family budgets
- solve problems involving measurement, geometry, and trigonometry
- organize and analyze data

Students will be expected to reason mathematically and communicate their thinking clearly as they solve multi-step problems. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning.

Prerequisite: Foundations for College Mathematics, Grade 11, College Preparation, OR Functions and Applications, Grade 11, University/College Preparation (MBF 3C, MCF 3M)

Mathematics for College Technology, Grade 12 – College Preparation

MCT 4C

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.

Prerequisite: Functions, Grade 11, University/College Preparation (MCR 3U) OR
Functions and Applications, Grade 11, University Preparation (MCF 3M)

Mathematics of Data Management, Grade 12

MDM 4U

This course broadens students' understanding of managing data. Students will:

- apply methods for organizing and analysing large amounts of information
- carry out a culminating investigation that demonstrates the student's ability to collect, organize, and analyze one and two variable data
- learn various counting techniques and use these techniques to describe the probability of an event
- learn how to represent probability distributions numerically, graphically, and algebraically, (including the normal distribution)

At this level, students will need to reason mathematically and communicate their thinking clearly as they solve multi-step problems. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning.

Prerequisite: Functions, Grade 11, university Preparation (MCR 3U) OR
Functions and Applications, Grade 11, University/College Preparation - suggest at least 70% (MCF 3M)

Advanced Functions, Grade 12, University Preparation

MHF 4U

This course extends students' experience with functions. Students will:

- investigate the properties of polynomial, rational, logarithmic, and trigonometric functions
- develop factoring techniques for functions of degree 3 and higher
- investigate the laws of logarithms and solve exponential and logarithmic equations
- become familiar with radian measure for angles
- solve trigonometric equations and prove trigonometric identities
- develop techniques for combining functions
- broaden their understanding of rates of change

At this level, students will need to reason mathematically and communicate their thinking clearly as they solve multi-step problems. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning

Prerequisite: Functions, Grade 11, University Preparation (MCR 3U) or
Mathematics for College Technology, Grade 12, College Preparation (MCT 4C)

Calculus and Vectors, Grade 12, University Preparation

MCV 4U

This course is intended for students who choose to pursue careers in fields such as science, engineering, economics, and some areas of business. Students will:

- represent vectors in two-space and three-space both graphically and algebraically
- perform mathematical operations on vectors and use the properties of these operations to solve problems
- extend their knowledge of equations of lines to include lines and planes drawn in three-space
- solve problems involving geometric and algebraic representations of vectors
- broaden their understanding of rates of change
- calculate derivatives of polynomial, sinusoidal, and exponential functions
- make connections between the graphical, numerical and algebraic representations of those derivatives
- solve problems, such as optimizing problems, that require the use of the concepts and procedures associated with the derivative

At this level, students will need to reason mathematically and communicate their thinking clearly as they solve multi-step problems. Students will be expected to work in groups and individually. Technology will be used during the processes of teaching and learning

Prerequisite: Advanced Functions, Grade 12, University preparation (MHF 4U) must be taken prior to or concurrently with this course. (It is recommended that Advanced Functions be taken prior to this course.)