

Richmond Hill High School

MATHEMATICS DEPARTMENT



201 YORKLAND STREET, RICHMOND HILL, ONTARIO, CANADA – L4S 1A2 – 905-884-2131

Courses: Advanced Functions (MHF4UE)
AP Calculus AB (MCV4UE)
Vectors

Textbooks: Advanced Functions 12 (McGraw-Hill Ryerson)
Calculus: Graphical, Numerical, Algebraic: AP Edition (Pearson Prentice Hall)
Calculus and Vectors (Nelson)

Rationale:

MHF4UE

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: Functions, Grade 11, University Preparation (MCR3U or MCR3UE)

MCV4UE

This course builds on students' experience with functions and introduces the basic concepts and skills of calculus. Students will investigate and apply the properties of polynomial, exponential, and logarithmic functions; broaden their understanding of the mathematics associated with rates of change; and develop facility with the concepts and skills of differential calculus as applied to polynomial, rational, exponential, trigonometric and logarithmic functions. Students will apply these skills to problem solving in a range of applications. In addition, students will be introduced to the geometry and algebra of vectors. They will learn to represent and perform operations on vectors algebraically, geometrically and via applications. They will learn to represent lines in planes and three-space using vector, parametric and symmetric equations and solve related problems.

Prerequisite: Advanced Functions (MHF4UE)

The Ontario Curriculum, Grade 12: Mathematics, 2007

Course Goals

In this course, students will:

- Work with functions represented graphically, numerically, analytically, and verbally and understand their connections.
- Understand the meaning of the derivative as a rate of change and local linear approximation, and use derivatives to solve problems.
- Understand the meaning of the definite integral as a limit of Riemann sums and as the net accumulation of change, and use definite integrals to solve problems.
- Understand the relationship between the derivative and definite integral.
- Communicate mathematics and explain solutions both verbally and in written form.
- Model a written description of a physical situation with a function, a differential equation, or an integral.
- Use technology to help solve problems, experiment, interpret results, and support conclusions.
- Determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement.
- Develop an appreciation of calculus as a coherent body of knowledge and as a human accomplishment.

Course Overview:

MHF4UE					
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Polynomial Functions	Rational Functions	Trigonometry	Trigonometric Functions	Exponential and Logarithmic Functions	Combining Functions
<ul style="list-style-type: none"> characteristics of polynomial functions solving equations and inequalities factor and remainder theorems 	<ul style="list-style-type: none"> characteristics of rational functions graphing rational functions asymptotes 	<ul style="list-style-type: none"> radian measure graphing primary and reciprocal trig functions transformations 	<ul style="list-style-type: none"> trig functions solving equations solving problems Identities 	<ul style="list-style-type: none"> exponent laws laws of logarithms solve exponential and logarithmic equations 	<ul style="list-style-type: none"> consolidate characteristics of functions composition of functions graphing combinations of functions
Chapters 1 - 2	Chapter 3	Chapters 4 – 5	Chapters 4 – 5	Chapters 6 - 7	Chapter 8

MCV4UE (AP Calculus) (Pearson)			MCV4UE Calculus & Vectors (Nelson)	
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Functions, Graphs, and Limits (3 weeks)	Derivatives (10 weeks)	Integrals (5 weeks)	Vectors	Lines and Planes
1.2 – 1.6 2.1-2.4 & 8.3 4.1-4.3	2.4 3.1-3.9 4.1-4.6 6.1 & 6.4-6.5	4.2 5.1-5.5 6.1-6.2, 6.4-6.5 7.1-7.5	Chapters 6 - 7	Chapters 8 - 9

Evaluation:

The Mathematics Department at Richmond Hill High School recognizes that assessment is a daily procedure. Teachers will monitor the learning skills component of the Provincial Report Card on a regular basis. These skills -- independence, teamwork, organization, work habits and initiative – will be assessed throughout the course. The students' final percentage grade will be calculated using the following guide:

Category		Weight
Term:		70%
Knowledge	30%	
Application	25%	
Thinking / Problem Solving	10%	
Communication	5%	
Final Exam		30%
Total		100%

Formative assessment is used on a daily basis to check for student understanding and to improve student learning. Descriptive feedback is provided. A variety of strategies will be used, and not worth marks, including: students' responses to teacher's questions, students' questions, teacher observations, exit cards, journal, self-assessment, peer-assessment, and quizzes.

Summative assessment is used to measure student learning. Tests will be written at the end of each unit, in addition to hand-in assignments and projects. A final examination is written at the end of the school year.

The AP Calculus multiple choice and free-response questions available from previous years will be used as both for both formative and summative assessment. The questions will be used as a teaching tool as well as become familiar with the AP exam.

In Ontario, marks can only be awarded for curriculum expectations in the course. Thus, when the curriculum expectations of the Ontario curriculum and the expectations of the AP Calculus AB programme overlap, marks will be used for the purpose of the report card. Expectations in the AP Calculus AB programme and not in the Ontario curriculum will not result in marks for the report card; rather, students will receive teacher feedback to prepare for the AP Exam. As mandated by the Ontario curriculum, the term is worth 70% of the course mark and the final examination 30%.

Attendance/Lates:

Students are expected to attend class each day. A lot of material is covered each period and it can be difficult to catch up if a student has repeated absences. Furthermore, the teacher establishes expectations with respect to the topics and their level of difficulty during class time. It is the student's responsibility to catch up on lessons and homework that have been missed. Ask your classmates for lessons and homework and the teacher can provide you with any handouts. Please also consult the math department's website at www.rhsmath.ca and follow the appropriate links.

If you know that you will be absent, you must let your teacher know **before hand**, especially if your absence is on the day of a quiz or test (see below).

Tests/ Quizzes:

Tests are based on a unit of work and are always announced in advance. Quizzes may or may not be announced in advance. They cover only recently assigned work.

If you are going to be legitimately away on the day that a quiz or test is written **the student** must make arrangements with the teacher prior to the day of the absence. Failure to do so may result in a mark of **zero**. Please note that missing a quiz or test due to an appointment or field trip and informing the teacher after the fact is unacceptable.

If you are away due to unforeseen illness, you must bring a note, signed by a parent or guardian, indicating that they are aware that you have missed a math test and the reason for your absence. This is **different from the note that you provide for the office and should be addressed to me**. This note is to be received within 3 school days after your return to school. Again, failure to do so may result in a mark of zero. In the event of a legitimate absence due to illness, your test mark may be replaced by the final exam mark. You will need to speak to your teacher immediately upon your return.

Extra Help

Students should be aware that extra help is available. It is not necessary to make an appointment in advance but you may do so if you wish to be sure that I do not have a conflicting appointment. If I am not available, please use the extra help room located in room 2028. This room is open everyday from 3:30pm – 4:20pm for extra help where there is always a teacher and / or student teaching assistants.