



Cameron Heights Collegiate Institute

301 Charles St. E., Kitchener, ON, N2G 2P8 (519) 578-8330, chc.wrdsb.ca.

Subject	Grade	Level	Code	Prerequisite
Analysis and Approaches (Standard Level)	12	University/IB	MCV4UW	MCV3UW

This course will alternate days with MHF4UW and can only be taken with that course throughout the same school year.

Course Description

This course has curriculum from both the International Baccalaureate programme and Ontario programme.

This course recognizes the need for analytical expertise in a world where innovation is increasingly dependent on a deep understanding of mathematics. This course includes topics that are both traditionally part of a pre-university mathematics course as well as topics that are amenable to investigation, conjecture and proof. There is a strong emphasis on the ability to construct, communicate and justify correct mathematical arguments. There will be a recognition that the development of mathematical thinking is important for a student.

This course will:

- Emphasize algebraic methods
- Develop strong skills in mathematical thinking
- Develop real and abstract mathematical problem solving

The course is intended for students interested in mathematics, engineering, physical sciences, and some economics.

IB Documents

- [Math Curriculum](#)
- [Mathematics Analysis and Approaches Subject Brief](#)
- [Formula Sheet](#)
- [Calculator Requirements](#)

Ministry Document

- [Ontario Grade 11-12 Math Curriculum](#)

IB Grade

For the February report card, all students in this course will be given a predicted IB grade (1 - 7) and associated Ontario percent grade. This grade will be modified based on student performance for the April report card. The final mark in the course will be potentially modified based on the IB exam grade.

The predicted grade is based on the student performance in both grade 12 IB courses.

Unit Outline

Each unit of study will have some form of assessment that will be weighted and used to determine a predicted grade for the February Report.

IB Internal Assessment (IA)

- Worth 20% of student's final IB grade
- Student picks topic of personal interest and explores the mathematics of that topic
- Final product is a single essay of 8-12 pages in length

<p style="text-align: center;">Unit of Study</p> <p><small>IB indicates the unit is part of the IB curriculum. ON indicates the unit is part of the Ontario curriculum.</small></p>	<p style="text-align: center;">Overall Expectations (Essential Understandings)</p>
<p>1. Limits and Rates of Change (IB, ON)</p>	<ul style="list-style-type: none"> • Linear/polynomial functions and the tangent problem • Limit of a function
<p>2. Derivatives Part 1 (IB, ON)</p>	<ul style="list-style-type: none"> • Definition of a derivative. • Derivative interpreted as gradient function and as a rate of change • Differentiation of a sum and a real multiple of various functions • Chain rule, product rule and quotient rule
<p>3. Derivatives Part 2 (IB, ON)</p>	<ul style="list-style-type: none"> • Implicit differentiation • Higher derivatives
<p>4. Applications of Derivatives (IB, ON)</p>	<ul style="list-style-type: none"> • Rates of change • Velocity and acceleration
<p>5. Extreme Values (IB, ON)</p>	<ul style="list-style-type: none"> • Increasing/decreasing functions • Applied max/min values
<p>6. Curve Sketching (IB, ON)</p>	<ul style="list-style-type: none"> • Linear asymptotes • Concavity • Procedure for curve sketching
<p>7. Derivatives of Transcendental Functions (IB, ON)</p>	<ul style="list-style-type: none"> • Limits of trigonometric functions • Derivatives of trigonometric, logarithmic and exponential functions • Exponential growth and decay • Logarithmic differentiation
<p>8. Antiderivatives and Integration (IB)</p>	<ul style="list-style-type: none"> • Antiderivatives and differential equations • Problems involving motion. • Area under a curve • Volumes of revolution • Integration rules