ADVANCED MATHEMATICS WITH CALCULUS 120

TEACHER: R. Stewart

TEXTS: Mathematical Modeling Book #4
Calculus: A First Course (*Stewart*)

WEBSITE: http://math.mvhs.nbed.nb.ca

COURSE DESCRIPTION:

This course is an <u>elective</u> advanced senior level Mathematics course. The course is designed to ensure that students obtain the necessary foundation to pursue post-secondary programs that will require students study introductory Calculus. The intent of this class will be to continue the development of mathematical skills, while concurrently providing insight into the power of differential and integral Calculus.

MATERIALS NEEDED:

- Scientific calculator
- Pencils and an eraser
- Notebook/Binder to maintain daily notes and homework exercises

ATTENDANCE:

The pace of this course will be rapid; students will be expected to maintain excellent attendance. In the event of an absence, students are responsible for all missed work. The school attendance policy regarding exemptions is in place for this course. If a student is absent for a test without a valid excuse, they will be given a mark of zero. It will be the responsibility of the student to present a satisfactory written excuse and arrange to write the test on his or her own time.

TOPICS:
- **COMPLEX NUMBERS**
  Operations
  Principle of Equality
  Complex Roots
  Polar Coordinates
  De Moivre's Theorem

- **LIMITS**
  Evaluating limits (substitution and indeterminate)
  One-sided limits and continuity
  Limits at infinity
  Evaluating trigonometric limits

- **DERIVATIVES**

  Determining derivatives using First Principle $\left(\lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h} \right)$

  Rules of differentiation: Power Rule, Product Rule, Quotient Rule, Chain Rule
  Differentiation formulas for trigonometric and inverse trigonometric functions
  Derivatives of exponential and logarithmic functions

- **APPLICATIONS OF DERIVATIVES**

  Slopes and equations of tangents and normal lines to a curve
  Displacement, velocity, and acceleration
  Implicit Differentiation
  Higher order derivatives
  Related rate problems
  Extreme values and optimization problems (maximum and minimum values)
  Curve Sketching: intercepts, intervals of increase/decrease, local
  maximum/minimum values, regions of concavity, inflection points
  Logarithmic Differentiation

EVALUATION:

Tests / Quizzes / Assignments	60 %
Midterm	10 %
Exam	30 %

NOTE:
STUDENT GRADES IN THIS COURSE CAN BE CHECKED ONLINE AT ANY TIME VIA THE MATH DEPARTMENT WEBSITE OR MIRAMICHI VALLEY HIGH SCHOOL HOMEPAGE.

To <u>Learn</u> Math Is To <u>Do</u> Math !!!