RICHVIEW COLLEGIATE INSTITUTE

PROGRAM AREA: Mathematics	**COURSE NAME: Advanced Functions**
COURSE CODE: MHF4U1	**GRADE/LEVEL: 12**
PREREQUISITE: Functions (University) Grade 11 or Math for College Grade 12	**CREDIT VALUE: 1**

Cost of Textbook/equipment replacement: **$100** *(if lost or damaged)*

Additional Course Costs: None

Textbooks(s)/Resources: **Advanced Functions 12**, **McGraw-Hill Ryerson**

Teacher:

COURSE DESCRIPTION:

Students will investigate the properties of polynomial, rational, exponential, 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 refine their use of the mathematical processes necessary for success in senior math. This course is intended as a prerequisite for students taking the Calculus and Vectors course for a university program and for students wishing to consolidate their understanding of mathematics before proceeding to any one of a variety of university programs.

CURRICULUM STRANDS (UNITS) and OVERALL EXPECTATIONS:

1. Exponential and Logarithmic Functions
- *** demonstrate an understanding of the relationship between exponential and log expressions, evaluate logs, and apply the laws of logs**
- *** identify some key features of the graphs of exponential and log functions and solve related problems graphically**
- *** algebraically solve exponential and log equations, including those in problems arising from real-world applications**

2. Trigonometric Functions
- *** demonstrate an understanding of the meaning and application of radian measure**
- *** make connections between trig ratios and the graphical and algebraic representations of the corresponding trig functions and between trig functions and their reciprocals, and use these concepts to solve problems**
- *** solve problems involving trig equations and prove trig identities**

3. Polynomial and Rational Functions
- *** identify and describe some key features of polynomial functions and make connections between the numeric, graphical, and algebraic representations of polynomial functions**
- *** identify and describe some key features of the graphs of rational functions and represent rational functions graphically**
- *** solve problems involving polynomial and rational equations graphically and algebraically**
- *** solve polynomial and rational inequalities**

CURRICULUM STRANDS (UNITS) and OVERALL EXPECTATIONS: ***(continued)***

4. Characteristics of Functions

- *** demonstrate an understanding of average and instantaneous rates of change for all functions**
- *** determine numerical and graphically and interpret the average rate of change over a given interval and the instantaneous rate of change at a given point for all functions**
- *** determine functions that result from a combination of 2 or more functions, describe the properties of these resulting functions, and solve related problems**
- *** compare the characteristics of functions and solve problems by modelling and reasoning with functions, including problems with solutions that are not accessible by standard algebraic techniques**

CURRICULUM STRANDS (UNITS) and OVERALL EXPECTATIONS: ***(continued)***
Throughout this course, students will

- **Problem Solve**
- **Reason and Demonstrate**
- **Reflect, and apply**
- **Select Tools and Computational Strategies**
- **Connect (between mathematical concepts and procedures)**
- **Represent and determine through investigation**
- **Communicate**

Assessment and Evaluation

Assessment and Evaluation are based on the expectations and levels of achievement outlined in the provincial curriculum document for each subject. A wide range of assessment and evaluation opportunities allows students to demonstrate their learning in a variety of ways. This information provides the basis for reporting student grades on the Provincial Report Card.
A final mark will be calculated using the following categories or strands.

Formative Evaluation: ***(70% of the final mark will be based on evaluations conducted throughout the course)***
All four achievement categories/strands do not need to be evaluated in each evaluation task.

Communication (15%)	Knowledge/Understanding (35%)	Thinking and Inquiry (15%)	Application/Making Connections (35%)
quizzes / tests / assignments *journals* *following instructions* *math conventions* *presentations / reports*	*quizzes / tests / assignments* *math conventions* *presentations / reports*	*tests / assignments* *math conventions* *presentations / reports*	*quizzes / tests / assignments* *math conventions* *presentations / reports*

Summative Evaluation: ***(30% of the final mark will be based on a final evaluation in the form of culminating activities).***

Components of Summative Evaluation: ***Exam (30%)***

All 4 categories (communication, knowledge, TIPS, and applications) will be represented on the exam.
***** A detailed explanation of the culminating activity/activities will be distributed to students in the class.***
No student is exempt from the final exam.
Summer school may be available to students who achieve between 35% and 49%.

Learning Skills: ***The report card provides a record of the learning skills, demonstrated by the student in every course in the following six categories: Responsibility, Independent Work, Initiative, Organization, Collaboration, Self-Regulation. The learning skills are evaluated using a four-point scale (E-Excellent, G-Good, S-Satisfactory, N -Needs Improvement).***

Please refer to the Student Agenda Planner for details regarding the Achievement Chart and Learning Skills.

We believe that homework completion is essential for student success.