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|  | **Glendale Secondary School**  **Mathematics Course Outline 2015/2016** Advanced Functions, Grade 12: MHF 4U |  |

**PREREQUISITE:** MCR 3U or MCT 4C **HOURS:** 110 **CREDIT VALUE:** 1

**DEPARTMENT HEAD:** Mrs. R. Southern **TEXTBOOK:** Advanced Functions 12: McGraw-Hill Ryerson

**REQUIRED MATERIALS**: Calculator, pencil, ruler and textbook

**GUIDELINE:** The Ontario Curriculum Grades 11 and 12

The text will be provided without charge. The student is responsible for returning the book in reasonable condition. The student will be charged for lost or damaged books. **Textbook replacement cost:** $90

**COURSE DESCRIPTION:**

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.

**STRANDS and OVERALL EXPECTATIONS:**

**EXPONENTIAL AND LOGARITHMIC FUNCTIONS**

**1.** demonstrate an understanding of the relationship between exponential expressions and logarithmic

expressions, evaluate logarithms, and apply the laws of logarithms to simplify numeric expressions;

**2.** identify and describe some key features of the graphs of logarithmic functions, make connections

among the numeric, graphical, and algebraic representations of logarithmic functions, and solve

related problems graphically;

**3.** solve exponential and simple logarithmic equations in one variable algebraically, including those

in problems arising from real-world applications.

**TRIGONOMETRIC FUNCTIONS**

**1.** demonstrate an understanding of the meaning and application of radian measure;

**2.** make connections between trigonometric ratios and the graphical and algebraic representations of

the corresponding trigonometric functions and between trigonometric functions and their reciprocals,

and use these connections to solve problems;

**3.** solve problems involving trigonometric equations and prove trigonometric identities.

**POLYNOMIAL AND RATIONAL FUNCTIONS**

**1.** identify and describe some key features of polynomial functions, and make connections between the

numeric, graphical, and algebraic representations of polynomial functions;

**2.** identify and describe some key features of the graphs of rational functions, and represent rational

functions graphically;

**3.** solve problems involving polynomial and simple rational equations graphically and algebraically;

**4.** demonstrate an understanding of solving polynomial and simple rational inequalities.

**CHARACTERISTICS OF FUNCTIONS**

**1.** demonstrate an understanding of average and instantaneous rate of change, and determine,

numerically and graphically, and interpret the average rate of change of a function over a given

interval and the instantaneous rate of change of a function at a given point;

**2.** determine functions that result from the addition, subtraction, multiplication, and division of two

functions and from the composition of two functions, describe some properties of the resulting

functions, and solve related problems;

**3.** 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.

***The primary purpose of assessment and evaluation is to improve student learning***

**ASSESSMENT**

The process of assessing student learning is continuous and on-going. Teachers use information gathered through assessments to provide feedback for students, to guide instruction and develop individual learning goals for students. This is assessment ***for*** learning. Students use this feedback to continuously improve their achievement and set individual learning goals. This is assessment ***as*** learning. Information from assessments informs the teacher’s professional judgment, but is not used in determining the student’s level of achievement.

**EVALUATION**

Evaluation is the process of determining a level of student achievement of the Overall Expectations for a course, which is recorded as a mid-term or final grade on a report card.

Students will be given numerous and varied opportunities to demonstrate their achievement of the Overall Expectations across the four categories of achievement (Knowledge & Understanding, Thinking, Communication and Application). Evidence of student achievement of the Overall Expectations is collected over time from three different sources – observations, conversations and student products.

To be successful students **must demonstrate achievement of EACH of the Overall Expectations** for the course. If a student is missing evidence of achievement of one or more of the Overall Expectations then a lower limit will be determined by the teacher.

In determining a report card grade teachers use their professional judgment to interpret the evidence of student achievement which reflects the student’s most consistent level of achievement with special considerations given to the more recent evidence.

The final grade is determined by the following breakdown:

**70 %** - evaluations made at the end of units throughout the semester.

**30%** - final demonstrations of learning (culminating activities and/or final examinations)

**REPORT CARDS**

Student progress is reported at 3 times during the semester.

**Interim Report** – October and March. Reports on student Learning Skills and Work Habits with next steps for improvement.

**Mid-term Report Card** – November and April. Reports on student achievement of the Overall Expectations to date. **Incomplete achievement** is reflected on Mid-term Report Cards, but replaced when learning has been demonstrated.

**Final Report Card** – February and July. Reports on student achievement of all of the Overall Expectations.

**ACADEMIC HONESTY**

Students are responsible for being academically honest in all aspects of their schoolwork. Academic dishonesty includes a variety of behaviours including cheating, plagiarism, facilitating or aiding academic dishonesty, and the unauthorized access or manipulating of student records, work and computer programs. Such behaviours impede the learning process and threaten the educational environment for all students.

Intentional academic dishonesty will result in disciplinary consequences. Teachers and parents should support students in striving for excellence and producing work with integrity.

**ATTENDANCE AND LEARNING SKILLS**

There is a direct link between good attendance and success at school. Students are expected to attend classes regularly and on time. Evidence of student achievement is gathered during classes through observations and learning conversations.

Learning Skills play an important role in a student’s level of achievement. Students will be assessed on the following learning skills: responsibility, independent work, collaboration, organization, initiative, and self-regulation.

**CELL PHONES/PERSONAL ELECTRONIC DEVICES**

Teachers will determine when personal electronic devices, including cell phones, will be used as instructional tools/supports. At other times these devices (with the exception of electronic translators) are not to be used and must be turned off and be stored away. Consequences for inappropriate use of these devices may include removal of the device from the learning environment.

**SCHOOL WIDE SUPPORTS**

* Student Support Team (formerly know as Learning Resource)
  + In-class help
  + Test and exam support
  + Alternate learning environment
* English Language Learner Support Team
  + Lunch-time help
  + Test and exam support
* Math lunch-time help
* Math Homework Help – on-line support
* Information via school website @ <http://schools.hwdsb.on.ca/glendale/>
* School wide access to password protected wireless network
  + Access to on-line resources
* Literacy Coaching
* Literacy @ Lunch
* Learning Commons @ Lunch
* Paper and electronic calendars
* Teacher/department Lunch-time/before/after school help

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I am aware of the course expectations and the policies and supports put in place for the student to be successful.

**Student’s Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Department Head Name**: Mrs. R. Southern **Contact Number**: 905-560-7343 ext.

**Email:** rsouther@hwdsb.on.ca

Parent/ Guardian Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_