

Forest Hill Collegiate Institute
Course of Study and Evaluation Statement

Functions & Applications, Grade 11: University/College Preparation

Note 1: All Ontario Ministry of Education curriculum documents with full course content information can be located at <http://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.html>

Note 2: Detailed information on Ministry of Education assessment, evaluation, and reporting policy is provided in *The Ontario Curriculum, Grades 9 to 12: Program Planning and Assessment, 2000*, located at <http://www.edu.gov.on.ca/eng/curriculum/secondary/progplan912curr.pdf>

1. Course Details

- Program Area: Mathematics
- Date of Development: September 2010
- Course title: Functions, Grade 11, University/College Preparation (MCF3M). Credit Value 1.0
- Prerequisites(s): MPM1D, MFM2P
- Textbook(s) and resource materials that are essential to the course: Functions and Applications Mathematic 11, McGraw-Hill Ryrson, 2008,

2. Overall Goals

- Course Description:
This course introduces basic features of the function by extending student's experiences with quadratic relations. It focuses on quadratic, trigonometric, and exponential functions and their use in modeling real-world situations. Students will represent functions numerically, graphically, and algebraically; simplifying expressions; solve equations; and solve problems relating to financial and trigonometric applications. Students will reason mathematically and communicate their thinking as they solve multi-step problems.

Overall Expectations

A. Quadratic Functions

- A1. Expand and simplify quadratic expressions and solve quadratic expressions
- A2. Determine, through investigation, the properties of quadratic functions
- A3. Solve and model problems involving quadratic functions

B. Exponential Functions

- B1. Explore, through investigation, the nature of exponential growth and decay, and solve related problems
- B2. Solve problems involving compound interest and annuities and analyse situations that require financial decision making, using spreadsheets or other appropriate technology.

C. Trigonometric Functions

- C1. Apply the sine law and the cosine law to solve problems involving acute triangles
- C2. Demonstrate an understanding of the sine function, and model periodic relationships arising from a variety of application using the sine function

• Specific Curriculum Expectations

Please refer to Ontario Ministry of Education curriculum document for details of Overall and Specific Expectations, found at <http://www.edu.gov.on.ca/eng/curriculum/secondary/math1112curr.pdf>

- Course content: unit titles in the sequence in which the material will be studied and a suggested time frame in hours as best as known at the time of printing

3. Program Planning Considerations

- *Individual Education Plan:* Accommodations to meet the needs of exceptional students as set out in their Individual Education Plan will be implemented within the classroom program. Additional assistance is available through the Special Education program.
- *The Role of Technology in the Curriculum.* Using information technology will assist students in the achievement of many of the expectations in the curriculum regarding research, written work, analysis of information, and visual presentations. The computer and the calculator are important problem-solving tools to be used for many purposes. Computers and calculators are tools of mathematicians, and students will be given opportunities to select and use the particular applications that may be helpful to them as they search for their own solutions to problems.

- *English As a Second Language (ESL)*: Appropriate accommodations in teaching, learning, and evaluation strategies will be made to help ESL students gain proficiency in English, since students taking ESL at the secondary level have limited time in which to develop this proficiency. Teachers will ensure that reading levels are appropriate to students' abilities and will strive for clarity in the use of mathematical terminology.
- *Career Education*: Expectations in the English program include many opportunities for students to apply their language skills to work-related situations, to explore educational and career options, and to become self-directed learners. Regardless of their post secondary destination, all students need to realize that literacy skills are employability skills.
- *Cooperative Education and Other Workplace Experiences*: The knowledge and skills students acquire in this courses will assist them in their senior level cooperative-education and work-experience placements related to this course. General information about cooperative education courses can be found at <http://www.edu.gov.on.ca/eng/document/curricul/secondary/coop/cooped.pdf>

4. Learning Skills

Learning Skills are skills and habits are essential to success in school and in the workplace. The Learning Skills evaluated are: Responsibility, Organization, Independent Work, Collaboration, Initiative and Self-regulation. Teachers report achievement on the six Learning Skills using letter symbols: E = Excellent, G = Good, S = Satisfactory, N = Needs Improvement.

Learning Skills clearly affect levels of achievement, but they are *not* part of the evaluation of achievement and are not included in the midterm mark or final course mark.

5. Academic Honesty: Cheating and Plagiarism

Students are expected to submit only their own original work on evaluations done in class or out of class. Plagiarism the passing off the ideas or writings of another as one's own. Cases of academic dishonesty (cheating and/or plagiarism) will be dealt with on a case-by-case basis, but each case will involve an investigation, communication with the student and his/her parent/guardian, and a mark of zero for the plagiarized work. Whether the student has an opportunity to demonstrate his/her learning in another assignment will be at the discretion of the teacher and/or Principal.

6. Teaching Strategies

Teachers use a variety of teaching strategies to maximize student learning. The following teaching strategies will be used in this course:

- *Direct Instruction* is highly teacher-directed. This strategy includes methods such as lecture, didactic questioning, explicit teaching, practice and drill, and demonstrations.
- *Interactive Instruction* relies heavily on discussion and sharing among participants. Interactive instruction may include total class discussions, small group discussions or projects, or student pairs or triads working on assignments together.
- *Independent Study* refers to the range of instructional methods which are purposefully provided to foster the development of individual student initiative, self-reliance, and self-improvement. The focus is on planned independent study by students under the guidance or supervision of a classroom teacher.

7. Assessment and Evaluation Strategies

Assessment and Evaluation of Student Achievement

The primary purpose of assessment and evaluation is to improve student learning. Assessment is the process of gathering information from assignments, demonstrations, projects, performances, and tests that accurately reflects how well a student is achieving the curriculum expectations in a course. As part of assessment, teachers provide students with feedback that guides their efforts towards improvement.

Evaluation refers to the process of judging the quality of student work on the basis of established criteria, and assigning a value to represent that quality. In Ontario secondary schools, the value assigned will be in the form of a percentage grade.

- In this course, the following evaluation strategies will be used: *homework, tests, quizzes, assignments, final evaluation.*

8. Achievement Chart

The achievement chart provides a standard, province-wide method for teachers to use in assessing and evaluating their students’ achievement. Students are evaluated according to the major categories or strands in each course. Ministry curriculum documents provide detailed description of student achievement levels.

In this course, students are evaluated in four strands, according to the weightings shown:

Knowledge/Understanding	Thinking/Inquiry	Communication	Application
30%	20%	20%	30%

9. 70% Mark on Course Work

- Students need to demonstrate achievement of all the overall expectations of the course. 70% of the final mark in the course will be based on work done prior to the culminating activities. Evaluations that are late, missing, and/or incomplete will affect a student’s 70% grade. See FHCI Evaluation Policy as printed in the Student Agenda Book for information about late, missed, and/or incomplete assignments. *See outline on next page for information regarding timing of evaluation.*

10. 30% Grade Based on Course Culminating Activities

- All students must take part in the culminating activities for each course at every grade and level of study. The steps to follow when a student is absent from one or more culminating activities is included in the FHCI evaluation policy as printed in the Student Agenda Book.
- Culminating activities that occur in class are held within the last three weeks of classes. Culminating activities that are formal examinations occur within the last nine days of the semester: *Final Examination*

11. Determining Marks for the Midterm Provincial Reports in November and April

This grade will be based on the evaluations that have been conducted to the midterm point in the course. Some of the Overall Expectations, categories/strands, and units will not have been addressed by the midterm, and the students’ grades will most likely change when the students’ entire work is evaluated by the end of the course.

12. Determining the Mark for the Final Report Card

The mark for the final will report card will be the sum of the 70% mark and the 30% mark.

13. Missed tests/quizzes policy

If a student is legitimately absent for a test or quiz, upon return to school, they must have a doctor’s note or a note from their parent or guardian stating the reason for their absence. At that time, and at the convenience of the teacher, the student will write a makeup test. If a student does not have a valid reason for his/her absence, **a mark of zero will be given.** *Every effort will be made by the subject teacher to notify students well in advance of scheduled test dates.*

Teacher Contact: 416-393-1860 Ext. 20080

Definition of Legitimate Absence

- Illness with a doctor’s note, Death in the family, Medical appointment (Advance notice required)
- Religious reasons (Advance notice required), School authorized field trip (Advance notice required)
- Court appearances (Advance notice required)

Contact: (416) 393 – 1860 ext. 20080

UNIT 1: Chapter 1 – Quadratic Functions

Review: Prerequisite Skills	1 Period	Pg 4 #1-3, 5-8
1.1 - Identify Functions	1 Period	Pg 12 #1-11, 16, 18
1.2 - Domain and Range	1 Period	Pg 20 #1-3, 5, 7, 9, 13, 14
REVIEW	1 Period	
Mini-Assessment 1.1-1.2 (Tentative)		
1.3 – Analyzing Quadratic Functions	1 Period	Pg 28 #1-5, 7, 8a
1.4 – Stretches of Functions	1 Period	Pg 38 #1-9
1.5 – Translations of Functions	1 Period	Pg 45 #1-5, 7-9, 11
1.6 – Sketch Graphs Using Transformations	1 Period	Pg 51 #1, 2, 3a, 4-8
REVIEW	1 Period	
Chapter 1 Evaluation	1 Period	

UNIT 2: Chapter 2 – Factor Quadratic Expressions

Review: Prerequisite Skills	1 Period	Pg 62 #2, 3, 6, 8, 10-12
2.1 – Quadratic Functions: Exploring Forms	1 Period	Pg 71 #1-10, 11a,b,c
2.2 – Quadratic Functions: Comparing Forms	1 Period	Pg 83 #1-4, 6, 10-13
REVIEW	1 Period	
Mini-Assessment 2.1-2.2 (Tentative)		
2.3 – Factor Quadratic Expressions of the Form ax^2+bx+c	2 Periods	Pg 96 #1-8, 11, 14 Worksheets
2.4 – Select and Apply Factoring Strategies	2 Periods	Pg 105 #1-9 Worksheets
2.5 – Solve Quadratic Equations by Factoring	1 Period	Pg 112 #1-6, 7a
UNIT REVIEW	1 Period	
Chapter 2 Evaluation	1 Period	

UNIT 3: Chapter 3 – Represent Quadratic Functions

Review: Prerequisite Skills	1 Period	Pg 122 #2-10 (every other letter)
3.1 – Complete the Square	2 Periods	Pg 132 #1,3,4,6,7,9,11 (all every other letter), 12-15
3.2 – The Quadratic Formula	1 Period	Pg 142 #1,2,4, 5-10,11ef, 12
REVIEW	1 Period	
Mini-Assessment 3.1-3.2 (Tentative)		
3.3 – Real Roots of Quadratic Equations	1 Period	Pg 150 #1,2,4,6-9,13
3.4 – Multiple Forms of Quadratic Functions	1 Period	Pg 161 #1,3,5,6 (every other letter),7,10
3.5 – Model With Quadratic Equations	1 Period	Pg 169 #1-3ab, 4
UNIT REVIEW	1 Period	
Chapter 3 Evaluation	1 Period	

UNIT 4: Chapter 4 – Trigonometry

Review: Prerequisite Skills	1 Period	Pg 184 #1, 2, 3, 5-13
4.1 – Use Trigonometry to Find Lengths	1 Period	Pg 189 #1-9, 11a, 15, 17
4.2 - Use Trigonometry to Find Angles	1 Period	Pg 194 #1-11
4.3 – Solve Problems Involving Two Right Triangles	1 Period	Pg 200 #1-6, 8, 9
REVIEW		
Mini-Assessment 4.1-4.3 (Tentative)		
4.4 – Investigate Sine Law	1 Period	Pg 207 #1-8, 10-12
4.5 – Investigate Cosine Law	1 Period	Pg 214 #1-10
4.6 – Make Connections With the Sine Law and Cosine Law	1 Period	Pg 219 #1-4, 7, 8, 18
REVIEW	1 Period	
Chapter 4 Evaluation	1 Period	

UNIT 5: Chapter 5 – Sine Functions

Review: Prerequisite Skills	1 Period	Pg 230 #1-5, 9-12
5.1 – Periodic Functions	1 period	Pg 235 #1-6, 8
5.2 – Circles and the Sine Ratio	1 Period	Pg 245 #1-14,16
5.3 – Investigate the Sine Ratio	1 Period	Pg 252 #2,3,5
REVIEW		
Mini-Assessment 5.1-5.3 (Tentative)		
5.4 – Investigate Transformations of Sine Curves	1 Period	Pg 261 #1-3, 5-8, 11,13
5.5 – Make Connections With Sine Functions	1 Period	Pick and choose
UNIT REVIEW	1 Period	
Chapter 5 Evaluation	1 Period	

UNIT 6: Chapter 6 – Exponential Functions

Review: Prerequisite Skills	1 Period	Pg 278 #1-3, 7-9
6.1 – The Exponent Rules	1 Period	Pg 285 #1-10, 13-15
6.2 – Evaluate Powers with Integer Exponents	1 Period	Pg 293 #1-11
6.3 – Investigate Rational Exponents	1 Period	Pg 302 #1-10, 12, 15
REVIEW		
Mini-Assessment 6.1-6.3 (Tentative)		
6.4 – Model Data With Exponential Functions	1 Period	Pg 309 #1, 2, 5, 6, 8, 10
6.5 – Exponential Functions and Their Properties	1 Period	Pg 317 #1-6, 7a
6.6 – Compare Linear, Quadratic, and Exponential Functions	1 Period	Pg 323 #1-5, 7-10
6.7 – Exponential Growth and Decay	1 Period	Pg 331 #1-3,4,6
REVIEW	1 Period	
Chapter 6 Evaluation	1 Period	

UNIT 7: Chapter 7 – Compound Interest

Review: Prerequisite Skills	1 Period	Pg 344 #1, 3-6, 9
7.1 – Explore Simple Interest and Compound Interest	1 Period	Pg 352 #1-6, 12, 13
7.2 – The Compound Interest Formula	1 Period	Pg 359 #1-5,7-9, 11,12,13
7.3 – Present Value	1 Period	Pg 365 #1-12
7.4 – Solve Financial Problems Using Technology	1 Period	Pick and choose
REVIEW	1 Period	
Chapter 7 Evaluation	1 Period	

UNIT 8: Chapter 8 – Annuities

Review: Prerequisite Skills	1 Period	Pg 380 #1, 2, 8, 9, 11, 12
8.1 – Future Value of an Ordinary Simple Annuity	1 Period	Pg 388 #4, 5, 6, 7, 9, 11
8.2 – Present Value of an Ordinary Simple Annuity	1 Period	Pg 395 #4, 5, 6, 7-9, 11-13
8.3 – Payments and Total Interest	1 Period	Pg 401 #1, 3, 4-8, 11, 12
8.4 – Effects of Changing the Conditions of an Ordinary Simple Annuity	1 Period	Pg. 409 #1, 2, 4-6, 8, 11, 12
REVIEW	1 Period	
Chapter 8 Evaluation	1 Period	

Note: Homework and Evaluation schedule may change depending on the needs of the students and changes due to scheduling of assemblies, meetings, field trips, etc.