Forest Hill Collegiate Institute
Course of Study and Evaluation Statement

Grade 10 Mathematics: Academic

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, 2010*, located at https://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf

1. Course Details
- Program Area: Mathematics
- Date of Development: Sept. 2018
- Course title: Principles of Mathematics, Grade 10, Academic (MPM2D). Credit Value 1.0
- Prerequisites(s): Mathematics, Grade 9, Academic or Applied with Transfer Course
- Textbook(s) and resource materials that are essential to the course: Principles of Mathematics 10, Nelson, 2010

2. Overall Goals
- Course Description:
  This course enables students to broaden their understanding of relationships and extend their problem-solving and algebraic skills through investigation, the effective use of technology, and abstract reasoning. Students will explore quadratic relations and their applications; solve and apply linear systems; verify properties of geometric figures using analytic geometry; and investigate the trigonometry of right and acute triangles. Students will reason mathematically and communicate their thinking as they solve multi-step problems.

- Overall Expectations are in the areas of Quadratic Relations of the Form $y = ax^2 + bx + c$; Analytic Geometry; and Trigonometry. By the end of the course, students will:
  - in **Quadratic Relations** of the Form $y = ax^2 + bx + c$
    * determine the basic properties of quadratic relations;
    * relate transformations of the graph of $y = x^2$ to the algebraic representation $y = a(x – h)^2 + k$;
    * solve quadratic equations and interpret the solutions with respect to the corresponding relations;
    * solve problems involving quadratic relations.
  - in **Analytic Geometry**
    * model and solve problems involving the intersection of two straight lines;
    * solve problems using analytic geometry involving properties of lines and line segments;
    * verify geometric properties of triangles and quadrilaterals, using analytic geometry.
  - in **Trigonometry**
    * use their knowledge of ratio and proportion to investigate similar triangles and solve problems related to similarity;
    * solve problems involving right triangles, using the primary trigonometric ratios and the Pythagorean theorem;
    * solve problems involving acute triangles, using the sine law and the cosine law.

- 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/math910curr.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: **Works Independently**, **Teamwork**, **Organization**, **Work Habits/Homework**, **Initiative**, **Self-regulation**. Teachers report achievement on the five 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 is 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.
- *Indirect Instruction* is mainly student-centred. Indirect Instruction includes inquiry, induction, problem solving, decision making, and discovery.
- *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.
- *Experiential Learning* is inductive, learner centred, and activity oriented. In Experiential Learning, students participate in an activity; critically look back on the activity to clarify learnings and feelings; draw useful insights from such analysis; and/or put learnings to work in new situations.
- *Independent Study* refers to the range of instructional methods which 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 chapters' evaluations 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 may be used: chapters/units' evaluations, assignments, class activities, final examination.

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	Communications	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 the course outline*

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.

Missed chapter(s) evaluation(s) policy
If a student is legitimately absent for a CHAPTER EVALUATION or EVALUATION, 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 CHAPTER EVALUATION. 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 CHAPTER EVALUATION dates.*

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)

13. Teacher Contact: 416-393-1860 Ext. 20080

Forest Hill Collegiate Institute
Course of Study and Evaluation Statement

Grade 10 Mathematics: Academic

UNIT 1:Chapter 1 – Systems of Linear Equations

REVIEW OF ESSENTIAL SKILLS – Integers/Exponent Laws/Evaluating and Simplifying Expressions/Solving Linear Equations (1.2)	2 Periods	pg 461 #1, 2, 3, 4, 5 pg 463 #1, 2, 3, 4, 5 pg 466 #1, 2, 3 pg 471 #1, 2, 3, 4, 5, 6 pg 472 #1, 2, 3, 4 pg 19 #4, 7, 8, 11
REVIEW – Graphing Linear Relations (1.1) Slope and y-intercept form, y=mx+b Standard form, Ax+By+C=0	1 Period	pg 470 #1, 2, 3, 4, 5, 6 pg 473 #1, 2 pg 13 #1ab, 5, 6, 7ab, 9
1.3 Solving Linear Systems Graphically	1 Period	pg 26 #1, 2, 3, 5, 9
EVALUATION 1.4 Solving Linear Systems by Substitution	1 Period	pg 38 #1, 3, 4, 5, 9ab, 16
1.6 Solving Linear Systems by Elimination Day 1: Integer Coefficients Day 2: Rational Coefficients	2 Periods	pg 54 #1, 4, 5, 6, 11acd
Solving Problems Using Linear Systems Day 1: Interest and Chemical Solutions Day 2: Measurement and Area Day 3: Time, Distance, and Speed	3 Periods	pg 39 #8, 11 pg 47 #13 pg 55 #9, 14, 15
1.7 Exploring Linear Systems	1 Period	pg 59 #1, 2, 3
EVALUATION/Review	1 Period	
Take up homework and review questions	1 Period	
UNIT EVALUATION #1	1 Period	

UNIT 2:Chapter 2 – Analytic Geometry: Line Segments and Circles

REVIEW OF PREREQUISITE SKILLS Pythagorean Theorem, Slope, Equation of a Line, and Parallel and Perpendicular Lines	1 Period	pg 68 #1, 2, 3
2.1 Midpoint of a Line Segment Altitudes, Medians, Right Bisectors	2 Periods	pg 78 #1-6, 9, 12, 13ac, 14, 15
2.2+2.3 Length of Line Segment Day 1: Length of Line & Equation of a Circle Day 2: Applications	2 Periods	pg 86 #1, 2, 4, 5acf, 6, 9, 10 pg 91 #1-6, 8, 10, 12, 14
EVALUATION 2.4 Classifying Figures on a Coordinate Grid	1 Period	pg 101 #1-3, 5, 7, 8, 11, 12, 13, 17
2.5 Verifying Properties of Geometric Figures	1 Period	pg 109 #1, 2, 4, 5, 9, 10, 13
2.7 Using Coordinates to Solve Problems	2 Periods	pg 87 #12 pg 120 #1-5, 6, 8
EVALUATION/Review	1 Period	
Take up homework and review questions	1 Period	
UNIT EVALUATION #2	1 Period	

UNIT 3:Chapter 4 – Factoring Algebraic Expressions + 3.4 Expanding Quadratic Expressions

REVIEW OF PREREQUISITE SKILLS Polynomials, Exponent Rules, Like Terms, GCF	1 Period	pg 194 #1, 2, 3, 5, 6
3.4 Expanding Quadratic Expressions	1 Period	pg 166 #3-10, 13, 14
4.1 Common Factors in Polynomials	1 Period	pg 203 #4-8, 9abc, 10, 11, 16
EVALUATION 4.3 Factoring Quadratics: x^2+bx+c	1 Period	pg 211 #3, 4, 6-12, 16
4.4 Factoring Quadratics: ax^2+bx+c Day 1: Guess & Check, Grouping Day 2: Trinomials with Two Variables	2 Periods	pg 223 #3-7, 9, 10-12, 15
4.5 Factoring Quadratics: Special Cases	1 Period	pg 230 #3-9, 10, 11, 14
4.6 Reasoning about Factoring Polynomials	1 Period	pg 236 #6-13
EVALUATION/Review	1 Period	
Take up homework and review questions	1 Period	
UNIT EVALUATION #3	1 Period	

UNIT 4:Chapter 3 – Graphs of Quadratic Relations + Chapter 5 – Applying Quadratic Models

3.1 – 3.2 Exploring Quadratic Relations/Properties	2 Periods	pg 136 #1, 2, 4-6
5.1+5.2 Graphing Quadratic Relations $y=ax^2+k$ Day 1: Graphing $y=x^2+k$ & $y=ax^2$ Day 2: Graphing $y=ax^2+k$	2 Periods	pg 256 #1, 2, 4, 5, 8, 11 pg 262 #1-5
5.3 Graphing Quadratics in Vertex Form $y=a(x-h)^2+k$ Sketching and Properties	2 Periods	pg 269 #1- 8, 11, 14, 15
5.4 Quadratic Models using Vertex Form	1 Period	pg 280 #1-7
5.5 Solving Problems using Quadratic Relations	1 Period	pg 293 #1, 2, 4-6, 7, 9, 10
EVALUATION 6.3 Completing the Square $y=ax^2+bx+c$ Day 1: Completing the Square $y=x^2+bx+c$ Day 2: Completing the Square $y=ax^2+bx+c$ Day 3: Max/Min Problems Day 4: Revenue Problems	4 Periods	pg 331 #1, 2, 3, 6-10 pg 147 #12, 13, 14 pg 294 #11, 13, 15
EVALUATION 3.3 Factored Form of a Quadratic Relation	2 Periods	pg 155 #1-7, 10, 11
GRAPHING CALCULATOR ACTIVITY 3.5 Quadratic Regression/Equation of Parabola of Good Fit	1 Period	pg 176 #5, 6
GRAPHING CALCULATOR ACTIVITY 3.6 Exploring Quadratic and Exponential Graphs	1 Period	pg 182 #3-8
UNIT REVIEW	1 Period	
Take up homework and review questions	1 Period	
UNIT EVALUATION #4	1 Period	

UNIT 5:Chapter 6 – Quadratic Equations

6.1 Solving Quadratic Equations by Factoring+Graphing Day 1: Solving by Factoring Day 2: Applications	2 Periods	pg 319 #2-8
6.4 The Quadratic Formula EVALUATION	2 Periods	pg 342 #1, 3-6, 9, 10, 12, 13, 15, 16
6.5 Interpreting Quadratic Equation Roots	1 Period	pg 350 #3, 5-7, 10
6.6 Solving Problems Using Quadratic Models	1 Period	pg 357 #2, 3, 9, 10, 11, 13
UNIT REVIEW	1 Period	
Take up homework and review questions	1 Period	
UNIT EVALUATION #5	1 Period	

UNIT 6:Chapter 7 – Similar Triangles and Trigonometry + Chapter 8: Acute Triangle Trigonometry

REVIEW OF PREREQUISITE SKILLS Proportions, Congruent Triangles, Angle Properties	1 Period	pg 370 #1-3, 5, 6
7.1-7.3 Similar Triangles	1 Period	pg 378 #1, 2, 7, 8 pg 386 #2-5, 7, 12
7.4 The Primary Trigonometric Ratios Day 1: Sine, Cosine, and Tangent Ratios Day 2: Applications	2 Periods	pg 398 #1-10, 11-13
7.5 Solving Right Triangles	1 Period	pg 403 #1-4, 7-11, 13
EVALUATION 7.6 Problems Involving Two Right Triangles Day 1: Angle of Elevation and Depression Day 2: Work Period-More Problems	2 Periods	pg 412 #1-4, 9, 11, 15, 16
8.1 The Sine Law 8.2 Applications	2 Periods	pg 433 #1-4, 6, 8, 11, 13
8.3 The Cosine Law 8.4 Applications	2 Periods	pg 443 #1-4, 6, 7
EVALUATION/Review	1 Period	
Take up homework and review questions	1 Period	
UNIT EVALUATION #6	1 Period	