Forest Hill Collegiate Institute
Course of Study and Evaluation Statement

Grade 10 Mathematics: Applied

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
- Course title: Foundations of Mathematics, Grade 10, Applied (MFM2P). Credit Value 1.0
- Prerequisites(s): Mathematics, Grade 9, Academic or Applied
- Textbook that is essential to the course: **Foundations of Mathematics 10, McGraw-Hill**

2. Overall Goals
- Course Description:
  This course enables students to consolidate their understanding of key mathematical concepts through hands-on activities and to extend their problem-solving experiences in a variety of applications. Students will solve problems involving proportional reasoning and the trigonometry of right triangles; investigate applications of piecewise linear functions; solve and apply systems of linear equations; and solve problems involving quadratic functions. The effective use of technology in learning and in solving problems will be a focus of the course.

- Overall Expectations are in the areas of Measurement and Trigonometry; Modelling Linear Relations; and Quadratic Relations of the Form $y = ax^2 + bx + c$. By the end of the course, students will:
  - in Measurement and 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 the surface areas and volumes of three-dimensional figures, and use the imperial and metric systems of measurement.
  - in Modelling Linear Relations
    * manipulate and solve algebraic equations, as needed to solve problems;
    * graph a line and write the equation of a line from given information;
    * solve systems of two linear equations, and solve related problems that arise from realistic situations.
  - in Quadratic Relations of the Form $y = ax^2 + bx + c$
    * manipulate algebraic expressions, as needed to understand quadratic relations;
    * identify characteristics of quadratic relations;
    * solve problems by interpreting graphs of quadratic relations.

- 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: **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.
- *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 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 may be used: **Homework, assignments, projects, investigations, in-class activities, quizzes, tests, and summative evaluation as end-of-semester exam**.

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 evaluations.

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, (s)he must have a doctor's note or a note from their parent/guardian stating the reason for their absence. At that time, and at the convenience of the teacher, the student will write a make-up 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.*

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)

14. Teacher Contact: *416-393-1860 Ext. 20080*

Foundations of Mathematics 10; McGraw-Hill Ryerson. (2007)

This chart shows which sections of <u>Foundations of Mathematics 10</u> should be covered.

UNIT 1	REVIEW: NUMERACY, POWERS, EXPRESSIONS AND POLYNOMIALS	COMMENTS	EXERCISES
1.1	*Numeracy: Integers and Rational Numbers*	*2 periods*	*handouts*
1.2	*Order of Operations & Powers*	*1 period*	*handouts*
1.3	*Evaluating Expressions & Formulas*	1 period	Hndt + p. 236 #1, p. 153 #5
1.4	Review of Exponent Laws	1 period	Handout(s)
1.5	Simplifying Polynomials	2 periods	(A) p.278 #1-4 (B) p.278 #5-9
	Review	1 period	Handout
	Practice Test		

UNIT 2	LINEAR EQUATIONS	COMMENTS	EXERCISES
Chapter 4	Get Ready	Opt.	p. 152 #1-5
2.1	Solve One and Two-Step Linear Equations	1 period	p.159 #2-6,8,9,12-14
2.2	Solve Multi-Step Linear Equations (A) Distribution & Rational Equations (B) Applications	2 periods	(A) p.169 #2-5 (B) p.170 #6-9, 12
2.3	Model with Formulas	1 period	p.180 #1-5,10
	Review		p.190 #1(a-d),2-10
	Practice Test		

UNIT 3	LINEAR RELATIONS	COMMENTS	EXERCISE
Chapter 3	Get Ready		p. 99 #6-8
3.1	Slope as a Rate of Change (A) Determining Slope (B) Applications	2 periods	(A) p.106 #1-4,6,7 (B) p.107 #5,8-10
3.2	Investigate Slope & Y-intercept (A) Graphing calculator investigation (B) Equation in y=mx+b form (C) Applications	2-3 periods	(A/B) p.111-112 In-class p.115 #3 (B) p.115 #1,2,4,6-8 (C) p.161 #10,16,19
3.3	Properties of Slopes of Lines	1 period	p.124 # 1-3,4(a,d), 5(b,d),6,7,8,14,15
3.4	Determine the Equation of a Line: (A) Given graph; Slope and a point (B) Given Two Points	2 periods	(A) p.133 #1-3,5 (B) p.134 #4,7,9,11
3.5	Graph Linear Relations by Hand	1 period	p. 143 #1,3,5
*3.6 (Chpt 4.4)	Convert Linear Equations from Standard Form	1 period	p.187 #1-4 (parts), 8,10
	Review		p.146 #1-3(a,c), 4, 5(a-c: graph by hand) ,6-8(a), 9,10(a-d), 11(a,c) p.191 #12,13
	Practice Test		

UNIT 4	SYSTEMS OF LINEAR EQUATIONS	COMMENTS	EXERCISES
Chapter 5	Get Ready		p.196 #1-6 (parts)
4.1	Solve Linear Systems by Graphing	1 period	p.201 #1-4(parts),8, 15-17
4.2	Solve Linear Systems by Substitution	1 period	p.209 #1-3(parts), 4-6, 10
4.3	Solve Linear Systems by Elimination	1 period	p.216 #1-4(parts) 6,9
4.4	Solve Problems Involving Linear Systems	1 period	p. 223 #1,3-5
	Review		p.226 #1,2,4,6,7,9-11
	Practice Test		

UNIT 5	QUADRATIC EXPRESSIONS	COMMENTS	EXERCISES
Chapter 7	Get Ready		p. 278 #1-9
5.1	A: Multiply Two Binomials B: Special Products (Expand & Simplify)	2 period	p. 286 #1-7, 10
5.2	Common Factoring	2 periods	(A) p. 294 # 1-7 (B) p. 295 # 8, 11, 14
5.3	Factor a Difference of Squares	2 periods	(A) p. 302 # 1-5 (B) p. 303 #7,8,10,12,13
5.4	Factor Trinomials of the Form $x^2 + bx + c$	2 periods	(A) p. 309 #1-4,6,7 (B) Handout
	Review	1 period	p. 312 #1-16
	Practice Test		

UNIT 6	QUADRATIC RELATIONS	COMMENTS	EXERCISES
Chapters 6,8	Get Ready		p. 236 #1, 2, 4 p.318 #1,2,3,5,6,7
6.1	Explore Non-Linear Relations	1 period	p. 241 # 1(b,c,d), 3, 5, 6
6.2	Key Features of Quadratic Relations	1 period	p. 260 # 1,4,6
6.3	Rates of Change in Quadratic Relations	1 period	p. 269 # 2, 5
6.4	Interpret Quadratic Relations	1 period	p. 323 # 1,2,3,10, 11
6.5	Analyze a Quadratic Relation A: Finding roots B: Max/Min & Vertex	2 periods	(A) p. 333 #1,2,4 (B) p. 334 #3,5,6,7,8,12,13
6.6	The Quadratic Relation $y = ax^2 + c$	1 period	p. 341 # 1,2,3(a,b),4,6, 7, 10
6.7	Modeling Quadratic Relations	1 period	Graphing calculators/handouts
	Review	1 period	p. 312 # 1,4,7 p. 352 # 3,5,6 (a,b), 9
	Practice Test		

UNIT 7	SIMILAR TRIANGLES AND RIGHT ANGLE TRIGONOMETRY	COMMENTS	EXERCISES
Chapters 1&2	Get Ready		
7.1	Similar Triangles	1 period	p. 25 #1a, 2ac,3,4,8,9
7.2	Solve Problems Using Similar Triangles	2 periods	p. 33 #4-7, 10, 12
7.3	The Pythagorean Theorem	1 period	p. 50 # 2ac, 3ac, 4ab, 5, 6a, 7ab, 10
7.4	The Sine and Cosine Ratios	1 period	p. 71 # 1ac, 2ab, 3a, 4, 6, 8, 11, 12
7.5	The Tangent Ratio	1 period	p. 79 # 1ac, 2ac, 3, 7, 9, 11, 12
7.6	Solve Problems Using Right Triangles	2 periods	(A) p. 86 #2, 4, 5 (B) p. 86 #7, 9, 11
	Review	1 period	p. 38 #10-12, 14, 15 p. 89 # 5,6,8-11,15,16
	Practice Test		

UNIT 8	MEASUREMENT SYSTEMS,VOLUME AND SURFACE AREA	COMMENTS	EXERCISES
Chapters 1&9	Get Ready		
8.1	Imperial Measure	1 period	p. 9 #1-6, 11, 12
8.2	Conversion between Metric and Imperial Systems	2 periods	(A) p.16 #1 (omit e,g), 2-5, 9 (B) p. 38n#3ac, 6,7,8
8.3	Volume of Prisms and Pyramids	1 period	p. 367 # 1ac, 2a, 3ace, 4ac, 5a, 6b, 9, 10
8.4	Surface Area of Prisms and Pyramids	1 period	p. 376 #1ace, 3ac, 4ac, 5b, 6, 8a
8.5	Surface Area and Volume of Cylinders	1 period	p. 385 #1ac, 2ac, 3ac, 5-8
8.6	Volume of Cones and Spheres	1 period	p. 394 #1ace, 2ace, 3, 5ac, 6acd
8.7	Solving Problems Involving Surface Area and Volume	1 period	p. 402 #1, 2ab, 3, 4, 6
	Review	1 period	p. 406 # 2-5, 7, 8 p. 38 # 10-12, 14, 15
	Practice Test		