

# **Canterbury High School**

Ottawa-Carleton District School Board

## **Mathematics Department**

Semester I – 2010 / 11 – Course Outline

<b>Course Title: Foundations for College Mathematics</b>	<b>Grade Level: 11</b>
<b>Course Code: MBF3C</b>	<b>Credit Value: 1.0</b>
<b>Prerequisite: MFM 2P</b>	

**Teachers:** E. Benoit and J. Vandenberg

**Course Overview** 110 hours

This course enables students to broaden their understanding of mathematics as a problem solving tool in the real world. Students will extend their understanding of quadratic relations; investigate situations involving exponential growth; solve problems involving compound interest; solve financial problems connected with vehicle ownership; develop their ability to reason by collecting, analysing, and evaluating data involving one variable; connect probability and statistics; and solve problems in geometry and trigonometry. Students will consolidate their mathematical skills as they solve problems and communicate their thinking.

### **Course Expectations**

As students work through the course they will develop a set of skills that will support lifelong learning in mathematics. These skills are a set of seven mathematical processes that are embedded throughout all of the course expectations; they are, problem-solving, reasoning and proving, reflecting, selecting tools and computational strategies, connecting, representing, and communicating. This course will provide students with rich problem-solving opportunities that will help the student develop and apply these processes.

#### **A. Mathematical Models**

By the end of the course, students will:

1. Make connections between the numeric, graphical, and algebraic representations of quadratic relations, and use the connections to solve problems;
2. Demonstrate an understanding of exponents, and make connections between the numeric, graphical, and algebraic representations of exponential relations;
3. Describe and represent exponential relations, and solve problems involving exponential relations arising from real-world applications.

## B. Personal Finance

By the end of this course, students will:

1. Compare simple and compound interest, relate compound interest to exponential growth, and solve problems involving compound interest;
2. Compare services available from financial institutions, and solve problems involving the cost of making purchases on credit;
3. Interpret information about owning and operating a vehicle, and solve problems involving the associated costs.

## C. Geometry and Trigonometry

By the end of this course, students will:

1. Represent, in a variety of ways, two-dimensional shapes and three-dimensional figures arising from real-world applications, and solve design problems;
2. Solve problems involving trigonometry in acute triangles using the sine law and the cosine law, including problems arising from real-world applications.

## D. Data Management

By the end of this course, students will:

1. Solve problems involving one-variable data by collecting, organizing, analysing, and evaluating data;
2. Determine and represent probability, and identify and interpret its applications.

## **Units of Study**

1. Trigonometry (~2 weeks)  
The primary trigonometry ratios are reviewed and then used to solve word problems. The sine and cosine law for acute triangles are investigated and then used for real world applications.
2. Geometry (~2 weeks)  
Three-dimensional objects are represented using isometric drawings, scale models, and orthographic projections. Nets, plans, and patterns for real world applications are examined and used with metric and imperial systems.
3. Probability (~3 weeks)  
Determine theoretical probability for an event and perform experiments, examining how theoretical and experimental probability could be different. Investigate uses of probability in the media and interpret the information.
4. Statistics (~2 weeks)  
Collect one-variable data, organize, and evaluate the results to solve problems. Examine sampling techniques, distributions, and measures of central tendency.

5. Quadratic relations (~4 weeks)  
Transformations of quadratic relations are investigated and sketched. Real world applications are studied by graphing and interpreting the functions. Algebraic skills are studied by expanding, factoring, and calculating x-intercepts.
6. Exponents (~2 weeks)  
Expressions with integer exponents are evaluated. Exponential relations are graphed and compared with quadratic and linear relations. Real world problems involving exponents are solved.
7. Personal Finance (~3 weeks)  
Compound interest is studied and used to calculate future value, and present value. The effect of changing interest rates, time, or compounding periods is investigated. Information about vehicles and the costs involved is gathered and interpreted. Investing and borrowing money is investigated and examined in real world examples.

### **Teaching Strategies**

Students will have the opportunity to learn in a variety of ways; individually, cooperatively, investigative, teacher directed class discussion and notes, visual aids and manipulatives (e.g., linking cubes, algebra tiles).

### **Assessment and Evaluation Strategies**

Student achievement will be monitored through the use of formative assessments in the form of quizzes, assignments, observations. Feedback on these assessments will provide the student with information to determine their level of understanding of the concepts. Student achievement will be recorded through the use of quizzes, tests, assignments/tasks. The percentage grade will represent the quality of the student's overall achievement of the expectations for the course and reflect the corresponding level of achievement as described in the achievement chart.

## **Evaluation Summary**

Term Evaluation (70%) comprised of:

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|----|--|---------|
| a) | <u>Knowledge and Understanding</u><br>(understand the concepts and computational skills of specific expectations)                | - 24.5% |
| b) | <u>Application</u><br>(knowing when and how to use appropriate tools and concepts to solve problems)                             | - 24.5% |
| c) | <u>Thinking</u><br>(being able to use critical and creative thinking skills to solve problems, connect ideas from other strands) | - 10.5% |
| d) | <u>Communication</u><br>(reflect and express through writing a mathematical solution or concept)                                 | - 10.5% |

Summative Evaluation (30%) comprised of:

- |    |   |       |
|----|---|-------|
| a) | <u>Summative Task</u> (problems using a variety of tools) | - 15% |
| b) | <u>Examination</u>  | - 15% |

## **References**

[www.edu.gov.on.ca/eng/curriculum/secondary/math1112currb.pdf](http://www.edu.gov.on.ca/eng/curriculum/secondary/math1112currb.pdf)

## **Student Resources / Texts**

1. Foundations for College Mathematics 11, McGraw-Hill Ryerson
2. Mathematics: Making Financial Decisions 11, McGraw-Hill Ryerson
3. Various other texts and resources (e.g., [www.oame.on.ca](http://www.oame.on.ca))