

Course Title

GRADE 12 APPLIED MATHEMATICS

Course Description

The grade 12 Applied Mathematics is directed to students planning to enter science, engineering or the high-tech world of work. This course is available to students planning to pursue post-secondary studies in mathematics and science.

Mathematics - General Learning Outcomes

1. Value the importance of mathematics in a wide variety of situations.
2. Investigate mathematical situations and present results using mathematical language.
3. Work both individually and cooperatively in small group situations.
4. Solve problems using a variety of techniques and communicate solutions in oral and written forms.
5. Use technology to learn new mathematical content.
6. Take personal responsibility for the mastery of concepts and skills.
7. Be able to use metric and imperial units of linear measure.
8. Demonstrate facility with technical communication.

Note: These learning outcomes are common through the 3 levels of Applied Mathematics and once acquired in Applied 20, will be extended in Applied 30 and 40. For example, the degree of student independence expected in Applied 40 is higher than that of Applied 20 or 30, where this skill is being developed.

Units of Study:

1. Matrix Modeling
2. Vectors
3. Personal Finance
4. Probability
5. Variability and Statistical Analysis
6. Design and Measurement
7. Sequences
8. Applications of Periodic Functions

Note: A student work book is provided to each student. This work book includes most of the assignments used during the course and has answer keys with detailed explanations for many of these assignments.

Evaluation Format:

Several types of evaluation will be used in the course. This will allow students to display their level of learning in a variety of manners and also expand their skill levels in different presentation methods. The approximate mark values for each of these methods will be as follows:

Unit Tests/Projects

50%

(These tests will be used to monitor student's concept development and mastery. This will also include mental math quizzes. Testing will be **cumulative** to constantly encourage student's recall of the entire course at any point).

Take Home Assignments

20%

(will be used to assess student's skill development in use of technology, independent and group work skill, and quality of work).

Final Exam

30%

(This is a **PROVINCIALY PREPARED EXAM** that will be written by all Grade 12 APPLIED math students. It will consist of a written and a project component).

Unit Outline

Unit Title: Matrix Operations

Timeline: September 9 – September 21

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- How matrix operations work: specifically matrix addition, subtraction and multiplication
- Apply matrices to problems
- Use matrices for transition (prediction) situation.
- Use matrices for network situations

Assessment and Evaluation Descriptors:

- Assignments - 20 marks
- Matrix Test - 50 marks

Resources:

Graphing calculators
Applied Grade 12 Exercise Books

Unit Title: Vectors

Timeline: September 22 – October 1

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- Learn the concepts of magnitude and direction as it applies to vectors
- Draw scale diagrams
- Learn about vector addition and resultant vectors
- Use vectors in practical time/distance applications

Assessment and Evaluation Descriptors:

- Assignments - 20 marks
- Cumulative test - 50 marks

Resources:

Graphing calculators
Computer Software (Geometer's Sketchpad)
Applied Grade 12 Exercise Books

Unit Title: Personal Finance

Timeline: October 2 – October 20

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- Students will learn the finances of an increasing asset (house)
- Loan amortization
- Future value of an investment
- Buying vs. renting a house
- Students will learn the finances of a decreasing asset (car)
- Loan payment options
- Buying vs. leasing
- Net worth statements

Assessment and Evaluation Descriptors:

- Project on previous exam projects - 20 marks
- Cumulative Test - 50 marks

Resources:

Graphing calculators
Spreadsheet (Excel)
Applied Grade 12 Exercise Books

Unit Title: Probability

Timeline: October 21 – November 3

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- How to solve pathway problems
- The fundamental counting principle
- Permutations and combinations
- Sample spaces
- Difference between mutually exclusive/inclusive events
- Difference between independent/dependent events

Assessment and Evaluation Descriptors:

- Assignments - 20 marks
- Cumulative Test - 50 marks

Resources:

Graphing calculators
Applied Grade 12 Exercise Books

Unit Title: Statistics

Timeline: November 4 – November 17

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- Students will learn about central tendency in data (mean, median, mode)
- Students will learn the concept of standard deviation
- Students will learn the meaning and use of z – scores
- Students will learn about normal distribution of data
- Students will learn how to use technology to solve problems involving the area under a normally distributed curve
- Students will learn how to solve confidence interval questions

Assessment and Evaluation Descriptors:

- Assignments - 20 marks
- Unit Test - 50 marks

Resources:

Graphing calculators
Applied Grade 12 Exercise Books

Unit Title: Design and Measurement

Timeline: November 18 – November 27

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- Students will learn to draw scale design diagrams
- Students will practice linear / area / volume measures
- Students will practice conversion from metric to American units of measure
- Students will work on numerous design and measurement problem situations

Assessment and Evaluation Descriptors:

- Assignments - 20 marks
- Unit Project (3 design and measurement problems) - 50 marks

Resources:

Graphing calculators
Applied Grade 12 Exercise Books

Unit Title: Sequences

Timeline: November 30 – December 9

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- Students will learn the difference between a recursive and an explicit sequence
- Students will learn about increasing and decreasing sequences
- Spreadsheets will be used to practice numerous situations involving sequential change.

Assessment and Evaluation Descriptors:

- Sequence spreadsheet project - 20 marks
- Cumulative Test - 50 marks

Resources:

Graphing calculators
Spreadsheet (Excel)
Applied Grade 12 Exercise Books

Unit Title: Periodic Functions

Timeline: December 10 – December 18

Teacher: Mr. S. S. Bath

Specific Learning Outcomes:

- Students will learn the basic properties of a sinusoidal functions
- Students will learn how to produce the sinusoidal equation from a given graph
- Students will learn how to produce a sinusoidal graph given the equation
- Students will learn how to input periodic data using technology to produce an equation and use it to answer questions
- Students will solve problems dealing with periodic functions

Assessment and Evaluation Descriptors:

- Word Problems - 20 marks
- Projects - 50 marks
- Applied Grade 12 Exercise Books

Resources:

Graphing calculators
Computer Software (Winplot)
Applied Grade 12 Exercise Books
