Earl of March Secondary School
Mathematics of Data Management, Grade 12, University Preparation (MDM4U)
Revised: March 2021

Course Description:
This course is designed for students with a credit in Functions, Grade 11, University Preparation (MCR3U) or Functions and Applications, Grade 11, University/College Preparation (MCF3M). It will broaden students' understanding of mathematics as it relates to managing data. Students will apply methods for organizing and analysing large amounts of information; solve problems involving probability and statistics; and carry out two culminating investigations that integrate statistical concepts and skills. Students will also refine their use of the mathematical processes necessary for success in senior mathematics. Students planning to enter university programs in business, science, the social sciences, and the humanities will find this course of particular interest.

Curriculum: The major strands and the overall expectations for the course are summarized below.
To learn more about the curriculum follow this link.
By the end of the course students will. . .

A. **Counting and Probability**
   - solve problems involving the probability of an event or a combination of events for discrete sample spaces;
   - solve problems involving the application of permutations and combinations to determine the probability of an event.

B. **Probability Distributions**
   - demonstrate an understanding of discrete probability distributions, represent them numerically, graphically, and algebraically, determine expected values, and solve related problems from a variety of applications;
   - demonstrate an understanding of continuous probability distributions, make connections to discrete probability distributions, determine standard deviations, describe key features of the normal distribution, and solve related problems from a variety of applications.

C. **Organization of Data For Analysis**
   - demonstrate an understanding of the role of data in statistical studies and the variability inherent in data, and distinguish different types of data;
   - describe the characteristics of a good sample, some sampling techniques, and principles of primary data collection, and collect and organize data to solve a problem**.**

D. **Statistical Analysis**
   - analyse, interpret, and draw conclusions from one-variable data using numerical and graphical summaries;
   - analyse, interpret, and draw conclusions from two-variable data using numerical, graphical, and algebraic summaries;
   - demonstrate an understanding of the applications of data management used by the media and the advertising industry and in various occupations.

E. **Culminating Data Management Investigation**
   - design and carry out a culminating investigation that requires the integration and application of the knowledge and skills related to the expectations of this course;
   - communicate the findings of a culminating investigation and provide constructive critiques of the investigations of others.

Earl of March Homework Policy - Helping Learning "Stick"
Learning requires a sincere commitment to work and study. Choosing to do homework is an essential part of a student's educational development. Homework helps students improve their academic and study skills, and is critical in the reinforcement of ideas and concepts presented in class. Also, homework helps students develop responsibility, independence, perseverance, time management skills and curiosity. The Ontario Curriculum emphasizes that there is a direct relationship between effort and student achievement. Homework will be assigned to students based upon reasonable expectations, and with the understanding that many students are involved in a variety of worthwhile activities outside of the school setting.

Student Resources: Most lessons, worksheets and solutions as well as instructions and timelines for all projects are posted in the teacher's handout folder. Students will use Google Sheets both in class and at home. In addition a textbook is available upon request**.**

Assessment Strategies
A variety of teaching/assessment strategies to address students' needs will be used during this course. Formative assessments will be ongoing throughout the academic year and students will receive descriptive feedback intended to help them improve their learning. The chart below outlines achievement levels with some quality descriptors. Levels will be used when assigning marks in this course.

Level	Descriptors
R: not a passable level of achievement	Insufficient demonstration of understanding
1: much below the provincial standard	Limited understanding, weak, lacking purpose
2: approaching the provincial standard	Some understanding, simplistic, somewhat purposeful
3: the provincial standard	Considerable understanding, solid, standard, purposeful, effective
4: surpassing the provincial standard	Consistent, thorough understanding, in depth, insightful to a purpose, efficient

Evidence of Student Achievement
Students may demonstrate their understanding of the course material in a wide variety of ways. Evidence of student achievement may come from observations, conversations, and students products. Student products may include tests, assignments, performance tasks, and the culminating project. A balanced combination of a student's Knowledge and Understanding, Thinking, Communication, and Application will be assessed. These 4 categories will not be separately evaluated. Instead, they will be *"considered as interrelated, reflecting the wholeness and interconnectedness of learning."*
– from the Ontario Ministry of Education curriculum documents.

Source of Evidence		Description
Observations		The teacher may record evidence of student achievement observed as students work on investigations in class.
Conversations		The teacher may record evidence of student achievement elicited during a conversation with a student
Products	**Tests**	There will be major unit tests.
	Assignments	Students may complete in-class assignments.
	Tasks	Students may demonstrate their creativity, knowledge and understanding of the material through performance tasks.
	Summative Tasks	Students will show evidence of their learning by performing tasks that will include many overall expectations of the course.

How Can Parents Help?
First of all, don't panic if you have forgotten anything about statistics and probability you ever knew. You can support your children's learning without teaching them. Having a positive attitude towards learning in general and mathematics in particular can go a long way. Consider also that teenagers are often unaware that the pathway to "success" is rarely a straight line; sharing your own personal experiences of frustration and struggle, perseverance and accomplishment may help your child see his or her own experiences in a new way. Students may also profit from help with their time-management skills when working on course projects.
Take a look at some of the sites below and see what you think; the internet is full of resources!

1. This Ontario Ministry of Education Student Success page provides links for parents, students, teachers and employers.
2. This PowerPoint presentation is designed for parents of students of all ages. Many ideas, questions and links are provided although not all are focussed on secondary education.
3. This link will take you to information from York University on Critical Thinking Skills.
4. Statistics Canada provides interesting data for students to consider.

If you have any questions, please feel free to contact your child's teacher.