CARDINAL LEGER CATHOLIC SECONDARY SCHOOL

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We believe that each one, created in the image and likeness of God, is called by name into the Dufferin-Peel community to realize the Ontario Catholic School Graduate Expectations to the fullest extent possible as we all journey from the early years to vocation.

COURSE OUTLINE

Department:	Mathematics

Course:	Grade 11 University Mathematics: Functions
Course Code:	MCR3U1

Common Course Calendar	**Course Description:** This course introduces the mathematical concept of the function by extending students' experiences with linear and quadratic relations. Students will investigate properties of discrete and continuous functions, including trigonometric and exponential functions; represent functions numerically, algebraically, and graphically; solve problems involving applications of functions; investigate inverse functions; and develop facility in determining equivalent algebraic expressions. Students will reason mathematically and communicate their thinking as they solve multi-step problems. This course will help students address the Ontario Catholic School Graduate Expectation that they adopt a holistic approach to life by integrating learning from various subject areas and experience.

Ministry/ICE Curriculum Documents	Strand/Unit Title	Corresponding Catholic Graduate Expectation Indicators for each Strand/Unit
	TRIGONOMETRIC FUNCTIONS By the end of this course, students will: **1.** determine the values of the trigonometric ratios for angles less than 360º; prove simple trigonometric identities; and solve problems using the primary trigonometric ratios, the sine law, and the cosine law; **2.** demonstrate an understanding of periodic relationships and sinusoidal functions, and make connections between the numeric, graphical, and algebraic representations of sinusoidal functions; **3.** identify and represent sinusoidal functions, and solve problems involving sinusoidal functions, including problems arising from real-world applications.	**- Integrates learning from various subject areas and experiences**

	EXPONENTIAL FUNCTIONS By the end of this course, students will: **1.** evaluate powers with rational exponents, simplify expressions containing exponents, and describe properties of exponential functions represented in a variety of ways; **2.** make connections between the numeric, graphical, and algebraic representations of exponential functions; **3.** identify and represent exponential functions, and solve problems involving exponential functions, including problems arising from real-world applications.	**- Thinks critically about the meaning and purpose of work.**
	DISCRETE FUNCTIONS By the end of this course, students will: **1.** demonstrate an understanding of recursive sequences, represent recursive sequences in a variety of ways, and make connections to Pascal's triangle; **2.** demonstrate an understanding of the relationships involved in arithmetic and geometric sequences and series, and solve related problems; **3.** make connections between sequences, series, and financial applications, and solve problems involving compound interest and ordinary annuities.	**- Applies effective communication, decision-making, problem-solving, time and resource management skills.**
	CHARACTERISTICS OF FUNCTIONS By the end of this course, students will: **1.** demonstrate an understanding of functions, their representations, and their inverses, and make connections between the algebraic and graphical representations of functions using transformations; **2.** determine the zeros and the maximum or minimum of a quadratic function, and solve problems involving quadratic functions, including problems arising from real-world applications; **3.** demonstrate an understanding of equivalence as it relates to simplifying polynomial, radical, and rational expressions.	**- thinks reflectively and creatively to evaluate situations and solve problems**

Assessment and Evaluation:

Category Weightings	Weight %
Knowledge/Understanding	30
Thinking	20
Application	30
Communication	20

Assessments	% of Grade
Term Work	70%
Final Exam	30%

Learning Skills and Work Habits E= Excellent G=Good S=Satisfactory N= Needs Improvement

Responsibility	• Fulfills responsibility and commitments. • Takes responsibility for and manages own behavior.
Organization	• Devises and follows a plan and process for completing tasks. • Establishes priorities and manages time
Independent Work	• Independently monitors, assesses, and revises plans to complete tasks and meet goals. • Uses class time to complete tasks.
Collaboration	• Accepts various roles and an equitable share of work in a group. • Builds healthy peer-to-peer relationships.
Initiative	• Looks for and acts on new ideas and opportunities. • Approaches new tasks with a positive attitude.
Self-Regulation	• Sets own goals and monitors progress towards achieving them. • Seeks clarification or assistance when needed.