

ST. CLAIR CATHOLIC DISTRICT SCHOOL BOARD
STUDENT INFORMATION SHEET/OUTLINE OF COURSE OF STUDY

School: St. Christopher Secondary School

Department: Mathematics

Course Title: Functions (MCR 3U)

Grade: 11

Course Type: University

Credit: One Full

Prerequisite: Grade 10 Academic

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.

HOW COURSE SUPPORTS THE ONTARIO CATHOLIC GRADUATE EXPECTATION:

Through the use of the Catholic course profile as well as additional resources (I.C.E. documents) the Ontario Catholic Graduate expectations will be addressed.

HOW THIS COURSE SUPPORTS THE COMPETENCIES OF CHOICES INTO ACTION:

Career Exploration Activities through classroom experience (page 19, Choices into Action)

1. Overall Expectation For Student Learning:

Through this course, the student will be expected to demonstrate knowledge, skills and values related to the following Strands:

Strand 1:

Characteristics of Functions

- demonstrate an understanding of functions, their representations, and their inverses, and make connections between the algebraic and graphical representations of functions using transformations;
- determine the zeros and the maximum or minimum of a quadratic function, and solve problems involving quadratic functions, including those arising from real-world applications;
- demonstrate an understanding of equivalence as it relates to simplifying polynomial, radical, and rational expressions.

Strand 2:

Exponential Functions

- evaluate powers with rational exponents, simplify expressions containing exponents, and describe properties of exponential functions represented in a variety of ways;

- make connections between the numeric, graphical, and algebraic representations of exponential functions;
- identify and represent exponential functions, and solve problems involving exponential functions, including those arising from real-world applications.

Strand 3:

Discrete Functions

- demonstrate an understanding of recursive sequences, represent recursive sequences in a variety of ways, and make connections to Pascal's triangle;
- demonstrate an understanding of the relationships involved in arithmetic and geometric sequences and series, and solve related problems;
- make connections between sequences, series, and financial applications, and solve problems involving compound interest and ordinary annuities.

Strand 4:

Trigonometric Functions

- determine the values of the trigonometric ratios for angles less than 360 degrees; prove simple trigonometric identities; and solve problems using the primary trigonometric ratios, the sine law, and the cosine law;
- demonstrate an understanding of periodic relationships and sinusoidal functions, and make connections between the numeric, graphical, and algebraic representations of sinusoidal functions;
- identify and represent sinusoidal functions, and solve problems involving sinusoidal functions, including those arising from real-world applications.

2. Expectations Regarding Learning Skills:

It is expected that students will demonstrate the following learning skills (this is not intended to be an exhaustive list). Learning skills will be assessed according to criteria which have been clearly communicated to students and will be reported separately from student achievement of the curriculum expectations. The student's demonstrated learning skills in each course will be evaluated using the four-point scale

(E - Excellent, G - Good, S - Satisfactory, N - Needs Improvement)

- Strong work habits during class time
- Completed homework and assignments
- Organizational skills on a daily basis
- Initiative in all areas of the course
- Independent learning ability
- Team work ability
- Frequent review of concepts and skills

3. Support For Higher Learning:

Whenever accommodations are made to address student learning needs, or alternative or modified expectations are identified for a student, these accommodations, modifications, or alternative expectations will be outlined in an IEP and will be communicated to parents.

4. Course Breakdown:

Unit Title/Description		Assessment & Evaluation Strategies	Unit Planning Notes
Unit 1	Sequences	checklists, assignments, tests	
Unit 2	Series and Financial Applications	checklists, assignments, tests	
Unit 3	Functions	checklists, assignments, tests	
Unit 4	Quadratic Functions and Rational Expressions	checklists, assignments, tests	
Unit 5	Modeling Periodic Functions	checklists, assignments, tests	
Unit 6	Trigonometry	checklists, assignments, tests	
Unit 7	Exponential Functions	checklists, assignments, tests	

5. Key Dates, Special Events and Additional Considerations:

- to be announced by the teacher

6. Teaching/Learning Strategies:

Instruction in this course will include but not be limited to the following:

- use of technology tools: graphing calculators, computers
- presentation of homework solutions to class
- whole class activities
- pairs activities
- group work

7. Assessment and Evaluation of Student Learning:

Student achievement of the learning expectations will be evaluated according to the following breakdowns:

Categories of the Achievement Chart	Weight %	
	Term Evaluation	Final Evaluation Activity/Exam
Knowledge/Understanding	40	40
Thinking/Inquiry/Problem Solving	15	15
Application	35	35

Communication	10	10
Breakdown of Final Marks (%)	70	30

8. Learning Resources:

Textbook: Mathematics 11, Nelson Publishing

9. School, Department & Classroom Policies:

The following policies apply to this course:

- use of student handbook: for reference and for time management**
- be prepared for class: paper, pencil, graph paper, calculator**
- keep work complete and up to date**
- correct all tests and assignments**