

St. Clair Catholic District School Board
Student Information Sheet/ Outline of Course Study

School	Ursuline College Chatham
Department	Mathematics
Course Title	Advanced Functions (MHF4U0)
Grade and Level	Grade 12, University Preparation
Credit	One full
Prerequisite	Grade 11 Functions University Preparation or Grade 12 Mathematics for College Technology College Preparation
Textbook	Advanced Functions (Nelson)
Department Head	Mrs. M. Taylor-Joyes
Ministry Document	Mathematics Grade 11 and 12 (Revised 2007)
Date	September 2011/February 2012

Course Description

This course extends students' experience with functions. Students will investigate the properties of polynomial, rational, logarithmic, and trigonometric functions; develop techniques of combining functions; broaden their understanding of rates of change, and develop facility in applying these concepts and skills. Students will also refine their use of the mathematical processes necessary for success in senior mathematics. This course is intended both for students taking the Calculus and Vector course as a prerequisite for a university program and for those wishing to consolidate their understanding of mathematics before proceeding to any one of a variety of university programs.

How this course supports the Ontario Catholic Graduate Expectations:

The following expectations from the Ontario Catholic Graduate Expectations will be stressed throughout the course: The graduate is expected to be: - An effective communicator who reads, understands and uses written materials effectively; - A reflective, creative and holistic thinker who thinks reflectively and creatively to evaluate situations and solve problems ; - A self-directed , responsible, lifelong learner who sets appropriate goals and priorities in school , work and personal life; - A collaborative contributor who works effectively as an independent team member; - A responsible citizen who accepts accountability for one's one actions.

How this course supports the competencies of Choices Into Action:

Career exploration activities through classroom experience (page 19, Choices into Action)

1) Expectations regarding Learning Skills

It is expected that students will demonstrate the following:

(this is not intended to be an exhaustive list)

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

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.

2) Overall expectations for student learning

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

<p>Unit 0: Review and extension of earlier work on functions</p> <ul style="list-style-type: none"> Review and extend terminology of functions (ie, domain, range, optimal values, areas of decrease or increase, functional notation) Review and extend transformational terminology associated with quadratic functions and extend to all other functional types Form inverses of functions and relations and study the properties of inverses 	<p>Unit 1: Polynomial Functions</p> <ul style="list-style-type: none"> Identify the keys features of polynomial functions and the corresponding connections between the graphical, numeric and algebraic representations of polynomial functions Solve problems involving polynomial equations graphically and algebraically Solve problems involving polynomial inequalities graphically and algebraically Develop an understanding of average and instantaneous rate of change and develop methods to determine average and instantaneous rates of change and apply to problems
<p>Unit 2: Rational Functions</p> <ul style="list-style-type: none"> Identify the keys features of rational polynomial functions and the corresponding connections between the graphical, numeric and algebraic representations of polynomial functions Solve problems involving rational equations graphically and algebraically Solve problems involving rational inequalities graphically and algebraically Develop an understanding of average and instantaneous rate of change and develop methods to determine average and instantaneous rates of change and apply to problems 	<p>Unit 3 Radian Measure and Trig Functions</p> <ul style="list-style-type: none"> Develop the concept of radian measure Graph primary and reciprocal trig functions in radian measure and identify the key features of the functions Solve trigonometric problems using a variety of methods Develop an understanding of average and instantaneous rate of change for trig functions and develop methods to determine average and instantaneous rates of change and apply to problems
<p>Unit 4: Transformations of Trig Functions (radians)</p> <ul style="list-style-type: none"> Graph and transform sinusoidal functions using radians. Identify properties using radian measures Develop equations of trig functions from the given graphs. Make connections between graph and algebraic trig equation Solve problems graphically using sinusoidal curves Prove trig identities and solve linear and quadratic trig equations 	<p>Unit 5: Exponential and Logarithmic Functions</p> <ul style="list-style-type: none"> Develop the inverse relationship between logarithmic and exponential functions Simplify exponential and logarithmic expressions Evaluate exponential and logarithmic expressions and equations Transform log and exponential functions and study rates of change of these types of functions Solve problems that can be modeled as either exponential or logarithmic functions
<p>Unit 6: Consolidate and extend Functions</p> <ul style="list-style-type: none"> Consolidate all functions and their properties and generalize these to cover new functions Create new functions using algebraic operations (add, subtract etc) Create composite functions and the key properties of these new functions 	

3) Individual Education Plan

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 & assessment and evaluation strategies

Unit title/Description	Suggested Timing
Unit 0 Review and Extension	7 periods
Unit 1 Polynomial Functions	17 periods
Unit 2 Rational Functions	7 periods
Unit 3 Radian Measure	10 periods
Unit 4 Trigonometric Functions Calculus	13 periods
Unit 5 Exponential and Logarithmic Functions	14 periods
Unit 6 Consolidate and Create New Functions	13 periods
Summative Performance Tasks	5 periods

5) Teaching/Learning Strategies

Instruction in this course will be evaluated according to the following breakdowns:
Group work, pair activities, individual work, computers and graphical calculators.

6) Assessment and Evaluation

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

Categories of Knowledge, Skills and Values	Weighting (%)	
	Term Evaluation (100%) Evaluation	Final
Knowledge & Understanding	45	
Thinking, Inquiry, Problem Solving	20	
Communication	15	
Applications	20	
BREAKDOWN OF FINAL MARK	70% of term mark	30%

7) School, department and classroom policies

- a) See student handbook for school rules
- b) **HOMEWORK** will be assigned almost every day. Depending on the topic, the time required to complete the assignment will vary, but at the grade twelve level the homework should require 45-60 minutes per night. To ensure success, any suggested homework assignments are to be completed for the beginning of the next class. The completion of assignments, neat and orderly notes, and routine correction of problems are essential for success.
- c) **REGULAR** and **PROMPT** attendance is required in order to be successful. If a student is absent it is their responsibility to make up for missed work. Notes should be copied from a

reliable student, and homework exercises attempted. Extra help is available and can be arranged with the teacher.

- d) **TESTS AND ASSIGNMENTS MISSED OR LATE.** The reasons for the absence or late will be taken into account, but a mark of zero can be assigned to the student for circumstances that seem to warrant such a mark. Assignments not submitted within the stated time frame may be cause for the student's overall grade to fall to a lower level.

Every effort should be made to write the test at the scheduled time period. Below are some test and assignment procedures:

- i) If you know that you will be away for a scheduled test and/or assignment due date for some legitimate reason, inform your teacher and make alternate arrangements before you leave.
- ii) If a test is missed due to a legitimate or sudden absence, it will be written at a time determined by the teacher after consultation with the student. The usual date for writing the test would be the first day back after the absence. A note signed by the parent/guardian must support such legitimate absences.
- iii) As a general rule, there will be no make-up tests or assignments. If special circumstances warrant, make-up tests or assignments may be provided to students who have demonstrated that earlier difficulties have been corrected.

To the student, Parent(s) or Guardian(s):

We have read and understand this Students Information Sheet/Outline of Course of Study

Course Code: MHF 4U0 (Grade 12 Advanced Functions)

Student: _____

Date: _____

Parent/Guardian: _____

Date:
