



Durham Catholic District School Board
1375 Harwood Ave N, Ajax, Ontario L1T 4G8
Tel: 905-686-4300 Fax: 905-686-4787
Principal: Mr. J. D'Amico
Vice Principals: Ms. L. Boehm, Ms. S. Brady

*Advanced Functions, Grade 12, University Preparation
MHF4U1 Course Overview*

Academic Year	2017-18	Teacher Names	Mrs. N. Kowalewski
Department	Mathematics	Curriculum Chair	Mr. D. Lamontagne

Curriculum Policy Document: Mathematics 2007 - The Ontario Curriculum Grades 11 and 12

Course Title	Advanced Functions	Course Code	MHF4U1
Prerequisite	MCR3U1 or MCT4C1	Grade and Course Type	12 University
Program Developer	Ministry of Education	Credit Value	1.0
Course Outline Developed	August 2013	Course Outline Revised	2017

Course Description

This course extends students' experience with functions. Students will investigate the properties of polynomial, rational, logarithmic, and trigonometric functions; develop techniques for 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 Vectors 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.

Course Content and Overall Expectations

Unit 1 – Exponential and Logarithmic Functions

- Demonstrate an understanding of the relationship between exponential expressions and logarithmic expressions, evaluate logarithms, and apply the laws of logarithms to simplify numeric expressions;
- Identify and describe some key features of the graphs of logarithmic functions, make connections among the numeric, graphical, and algebraic representations of logarithmic functions, and solve related problems graphically;
- Solve exponential and simple logarithmic equations in one variable algebraically, including those in problems arising from real-world applications.

Unit 2 – Trigonometric Functions

- Demonstrate an understanding of the meaning and application of radian measure;
- Make connections between trigonometric ratios and the graphical and algebraic representations of the corresponding trigonometric functions and between trigonometric functions and their reciprocals, and use these connections to solve problems;
- Solve problems involving trigonometric equations and prove trigonometric identities.

Unit 3 – Polynomial and Rational Functions

- Identify and describe some key features of polynomial functions, and make connections between the numeric, graphical, and algebraic representations of polynomial functions;
- Identify and describe some key features of the graphs of rational functions, and represent rational functions graphically;
- Solve problems involving polynomial and simple rational equations graphically and algebraically;
- Demonstrate an understanding of solving polynomial and simple rational inequalities.

Unit 4 – Characteristics of Functions

- Demonstrate an understanding of average and instantaneous rate of change, and determine, numerically and graphically, and interpret the average rate of change of a function over a given interval and the instantaneous rate of change of a function at a given point;
- Determine functions that result from the addition, subtraction, multiplication, and division of two functions and from the composition of two functions, describe some properties of the resulting functions, and solve related problems;
- Compare the characteristics of functions, and solve problems by modelling and reasoning with functions, including problems with solutions that are not accessible by standard algebraic techniques.

Class Guidelines and Program Considerations

Student Expectations:

Each student shall:

1. Be present for all lessons and tests (on time).
2. Be prepared with all necessary materials each class. (pencils, eraser, ruler, binder, lined + graph paper and scientific calculator).
3. Complete all homework and assignments to the best of his/her ability.
4. Contribute to classroom discussions.

Classroom Expectations:

Each student must:

1. Behave appropriately in class and work on task, giving full attention to the topic being studied.
2. Work cooperatively with other students and the teacher.
3. Maintain a positive attitude and display common courtesy to others in the classroom.
4. Treat computers, calculators and other classroom work tools with respect and closely follow teacher directives concerning such items.

Course Evaluation:

1. Homework is generally assigned each class. Homework difficulties will sometimes be discussed in class but it is the student's responsibility to seek extra help when necessary. Peer tutoring (Mon and Wed after school, room 1321), the Ontario Homework Help Online website, and extra help from the teacher are all resources available to help support students. Contact your teacher for more information.
2. Students need to be on time for class. If a student is persistently late, appropriate consequences will be determined by the teacher. If a student is legitimately late then they must present their teacher with a note explaining the lateness.
3. Student absence has a significant impact on student achievement. It is the student's responsibility to make up missed class work from illness, participation in school extracurricular activities or any other reason, so find a buddy! If a student must be absent, then it is the students' responsibility to complete the work missed and have the work completed upon the student's return. Please advise the teacher in advance if you know that you are going to be away.
4. Students must understand that there will be consequences for not completing assignments for evaluation or for submitting those assignments late. Late marks may be deducted in accordance with the Growing Success document. Failure to submit indicates that curriculum expectations are not being met; a zero may be recorded.
5. Most units/chapters will conclude with a Unit/Chapter Test. Students who are absent for a test have the responsibility of discussing their absence with the teacher. An undocumented absence for a test will result in an automatic mark of zero assigned. If, for a valid medical reason, a student is unable to write a Unit Test, the student must contact the teacher prior to the test. A note or phone call from a parent/guardian must confirm the reason for the student's absence day of/after the test.
6. Plagiarism is the act of passing off someone else's work as your own. Misuse of technological devices is considered cheating. Plagiarism or cheating will result in the student receiving a mark of zero on the assigned work.

Learning Strategies:

1. Assessment is an ongoing process that reflects how well a student is achieving the expectations. Based on the School Effectiveness Framework, assessment *as and for* learning involves goal setting for students and allows the teacher to gather evidence to determine where students are in their learning.
2. Strategies may include, but are not limited to: oral discussions, co-operative learning activities, differentiated instruction, homework checks, and individual consultations. These strategies are in place to help students clearly understand learning goals and success criteria.
3. Assessment *of* student learning involves assigning a value to judge the quality of student learning, for communication to parents and students. This may take place in the form of, but is not limited to: rich performance tasks, demonstrations, projects, essays, lab reports, problem solving tasks, written assignments, quizzes, tests, and presentations. All assessment of learning will count towards the student's grade and **no replacement** of these marks will be made.

Student Evaluation Criteria

Term Work (70% of final total)

Category	Knowledge	Thinking	Communication	Application
Weighting	30%	10%	10%	20%

Final Examination (30% of final total)

Mark Reporting Periods

	Semester 1	Semester 2
Parent-Teacher Interviews	October 19, 2017	March 21, 2018
Midterm Report Cards	November 10, 2017	April 20, 2018

Resources

Textbook: Gr 12 Advanced Functions, Nelson	Replacement Cost: \$100.00
Mrs.K's math website	http://www.mrsk.ca
Desmos Graphing Calculator Online	https://www.desmos.com/calculator
Ontario Homework Help	https://homeworkhelp.ilc.org/
Video solutions to selected textbook questions	https://prepanywhere.com
MOODLE	http://www.notredamecss.ca/moodle/