

## Advanced Functions MHF4U1

<p><b>Course Description:</b></p> <p>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.</p>	<p><b>Level:</b> University</p>
	<p><b>Credit Value:</b> 1.0</p>
	<p><b>Pre-requisite:</b> MCR3U</p>
<p><b>Department:</b> Mathematics</p>	<p><b>Course Fees:</b> \$0</p>
<p>The Advanced Functions Course (MHF4U) must be taken prior to or concurrently with the Calculus and Vectors Course (MCV4U)</p>	

<p><b>Textbooks &amp; Resources:</b></p> <ul style="list-style-type: none"> <li>• Growing Success: Assessment, Evaluation and Reporting in Ontario Schools</li> <li>• The Ontario Curriculum Document, Grades 11 and 12: Mathematics, 2007 (revised)</li> <li>• McGraw Hill Advanced Functions (Replacement Cost: \$105.00)</li> </ul>
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<p><b>Course Evaluation:</b> Student Evaluation consists of three components...</p>									
<p><b>1) Learning Skills &amp; Work Habits:</b> Students are evaluated on 6 Learning Skills &amp; Work Habits. The 6 essential skills are:</p> <ul style="list-style-type: none"> <li>• Responsibility</li> <li>• Organization</li> <li>• Independent Work</li> <li>• Collaboration</li> <li>• Initiative</li> <li>• Self-Regulation</li> </ul>	<p>These six attributes are evaluated on a scale of Excellent (E), Good (G), Satisfactory (S) &amp; Needs Improvement (N) and reported on the report card. They are not included in the course mark, unless specified in the curriculum expectations.</p>								
<p><b>2) Term Mark (Assessment of Learning):</b> Student performance standards for knowledge and skills are described in the curriculum Achievement Chart. The curriculum is assessed in four categories:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">• Knowledge and Understanding</td> <td style="text-align: right; padding: 2px;">30%</td> </tr> <tr> <td style="padding: 2px;">• Thinking and Inquiry</td> <td style="text-align: right; padding: 2px;">20%</td> </tr> <tr> <td style="padding: 2px;">• Communication</td> <td style="text-align: right; padding: 2px;">15%</td> </tr> <tr> <td style="padding: 2px;">• Application</td> <td style="text-align: right; padding: 2px;">35%</td> </tr> </table>	• Knowledge and Understanding	30%	• Thinking and Inquiry	20%	• Communication	15%	• Application	35%	<p>Evaluation of these four categories generates the term mark. The term mark accounts for 70% of the final mark.</p> <p><b>It is the student's responsibility to submitting evidence of learning.</b></p>
• Knowledge and Understanding	30%								
• Thinking and Inquiry	20%								
• Communication	15%								
• Application	35%								
<p><b>3) Final Evaluation (Assessment of Learning):</b> The final evaluation, administered at or towards the end of the course is based on the evidence shown to the right. The final evaluation accounts for 30% of the final mark.</p>	<p>The final evaluation consists of:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Exam</td> <td style="text-align: right; padding: 2px;">30 %</td> </tr> </table>	Exam	30 %						
Exam	30 %								
<p><b>Final Mark = 70% Term Mark + 30% Final Evaluation</b></p>									
<p>For a detailed description on Course Evaluation, see "How Did I Get That Mark!" at <a href="http://www.satec.on.ca">www.satec.on.ca</a></p>									

<p><b>Course Conduct Policies:</b> See Student Agenda.</p>
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**Please retain this page in the front of your notebook for future reference.**



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**Course Outline:**

<b>Unit</b>	<b>Description</b>	<b>Approximate Length</b>	<b>Unit Evaluation</b>
Polynomial Functions	Identify and describe some key features of polynomial functions, and make connections between the numeric, graphical, and algebraic representations of polynomial functions; demonstrate an understanding of average and instantaneous rate of change, and determine 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.	3 weeks	assignments, tests, quizzes
Polynomial Equations & Inequalities	Solve problems involving polynomial equations graphically and algebraically; solve polynomial inequalities.	2 weeks	assignments, tests, quizzes
Rational Functions	Identify and describe some key features of the graphs of rational functions, and represent rational functions graphically; solve problems involving simple rational functions graphically and algebraically; solve simple rational inequalities.	2 weeks	assignments, tests, quizzes
Trigonometry	demonstrate an understanding of the meaning and application of radian measure; solve problems involving trigonometric equations and prove trigonometric identities.	2 weeks	assignments, tests, quizzes
Trigonometric Functions	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.	2 weeks	assignments, tests, quizzes
Exponential & 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 features of the graphs of log functions, make connections among the numeric, graphical, and algebraic representations of log functions	2 weeks	assignments, tests, quizzes
Solving Exponential & Logarithmic Equations	solve exponential and related logarithmic equations algebraically and graphically	2 weeks	assignments, tests, quizzes
Combined Functions	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.	3 weeks	assignments, tests, quizzes

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**Note: The order of the units of study may change due to student needs and resources available during the course.**

### **General Information:**

Mathematics continually builds on previous lessons. Hence, daily attendance is important. Students are responsible for catching up on missed lessons and work.

It is expected that all students will write tests as a class group. If a student is unable to write the evaluation with the class, then the student must inform the teacher at least two school days in advance of the test so that alternate arrangements can be made.

Students who are absent on the day of the test due to illness or a family emergency must have their parents phone the math office at 416 396-3365 x20245 on the day of the test explaining why they will be absent. (Doctor's notes will be required from students who miss more than one scheduled test.) Alternate arrangements will be made for these students to write the test.

Students missing their tests or assignment deadlines due to unexplained absences will receive a mark of zero.

For more information on the missed test/assignment policies, please see the agenda.