

*Oakwood Collegiate Institute*

*991 St. Clair Ave. West  
Toronto, Ontario M6E 1A3  
Telephone: (416) 393-1780  
Fax: (416) 393-8169*

**Website: <http://schools.tdsb.on.ca/oakwoodci/>**

***Course of Study :*** Calculus and Vectors  
Grade 12 University Preparation  
MCV4U

<b>Academic Year: 2018-2019</b>		<b>Teacher Name:</b> <i>Mr. Burtch</i>	
<b>Department: Mathematics</b>		<b>Department Head:</b> <i>Mr. Burtch</i>	
<b>Date developed: June 23/09</b>		<b>Revised:</b> <i>June 2017</i>	
<b>Course Title</b>	Calculus and Vectors	<b>Course Code</b>	MCV4U
<b>Prerequisite</b>	The new Advanced Functions course (MHF4U) must be taken prior to Or concurrently with Calculus and Vectors (MCV4U) .	<b>Grade</b>	12/ 5 <sup>th</sup> year
<b>Level</b>	University	<b>Credit Value</b>	1.0

Course Description		
<b>Ontario Ministry of Education Document: The Ontario Curriculum, Grades 11 and 12 Mathematics Revised 2007</b>		
<p>This course builds on students' previous experience with functions and their developing understanding of rates of change. Students will solve problems involving geometric and algebraic representations of vectors and representations of lines and planes in three-dimensional space; broaden their understanding of rates of change to include the derivatives of polynomial, sinusoidal, exponential, rational, and radical functions; and apply these concepts and skills to the modelling of real-world relationships. Students will also refine their use of the mathematical processes necessary for success in senior mathematics. This course is intended for students who choose to pursue careers in fields such as science, engineering, economics, and some areas of business, including those students who will be required to take a university-level calculus, linear algebra, or physics course.</p>		
<b>Textbook: Calculus and Vectors (Nelson)</b>		
Instructional Strands/Units		
Strand/Unit Titles	Approx. Time Spent	Overall Expectations/Unit Description
RATE OF CHANGE	20 periods	<p>By the end of this course, students will:</p> <ol style="list-style-type: none"> <li>1. demonstrate an understanding of rate of change by making connections between average rate of change over an interval and instantaneous rate of change at a point, using the slopes of secants and tangents and the concept of the limit;</li> <li>2. graph the derivatives of polynomial, sinusoidal, and exponential functions, and make connections between the numeric, graphical, and algebraic representations of a function and its derivative;</li> <li>3. verify graphically and algebraically the rules for determining derivatives; apply these rules to determine the derivatives of polynomial, sinusoidal, exponential, rational, and radical functions, and simple combinations of functions; and solve related problems.</li> </ol>

Instructional Strands/Units (Cont'd)		
<i>Strand/Unit Titles</i>	<i>Approx. Time Spent</i>	<i>Overall Expectations/Unit Description</i>
DERIVATIVES AND THEIR APPLICATIONS	20 periods	<p>By the end of this course, students will:</p> <ol style="list-style-type: none"> <li>1. make connections, graphically and algebraically, between the key features of a function and its first and second derivatives, and use the connections in curve sketching;</li> <li>2. solve problems, including optimization problems, that require the use of the concepts and procedures associated with the derivative, including problems arising from real-world applications and involving the development of mathematical models.</li> </ol>
GEOMETRY AND ALGEBRA OF VECTORS	35 periods	<p>By the end of this course, students will:</p> <ol style="list-style-type: none"> <li>1. demonstrate an understanding of vectors in two-space and three-space by representing them algebraically and geometrically and by recognizing their applications;</li> <li>2. perform operations on vectors in two-space and three-space, and use the properties of these operations to solve problems, including those arising from real-world applications;</li> <li>3. distinguish between the geometric representations of a single linear equation or a system of two linear equations in two-space and three-space, and determine different geometric configurations of lines and planes in three-space;</li> <li>4. represent lines and planes using scalar, vector, and parametric equations, and solve problems involving distances and intersections.</li> </ol>

Student Evaluation Criteria			
Term Work		Culminating Activities	
Categories			
Knowledge/Understanding	15 to 30%	Examt	30%
Thinking	15 to 30%		
Communication	15 to 30%		
Application	15 to 30%		
Term Total 70%		Culminating Activity Total 30%	

	First Report	Second Report	Interim Report	Final Report
<b>Progress Reports</b>				
<b>Report Cards</b>				
<b>Parent/Teacher Interviews</b>				

### **Assessment of Learning Skills**

*The 6 learning skills: Responsibility, Organization, Independent Work, Collaboration, Initiative and Self Regulation, will be assessed using a variety of techniques including, but not limited to, homework checks, group work/research, class involvement, cooperative activities and independent work*

### **Assessment and Evaluation Tools**

<b><i>Knowledge/Understanding</i></b>	<b><i>Thinking and Application</i></b>	<b><i>Communication</i></b>
Quizzes	Investigations	Discussions
Tests	Projects	Participation
In-Class Assignments	Problem Solving	Written and oral communication of mathematical ideas
Homework	Real-World Applications	
	Explorations	
	Word Problems	

### **Communication**

<b><i>Parents</i></b>	<b><i>Contact the Math department at 393-1780 ext. 20038</i></b>
<b><i>Students</i></b>	<b><i>Contact your teacher in person</i></b>
<b><i>Extra help</i></b>	<b><i>By arrangement with your teacher</i></b>
<b><i>School Website</i></b>	<b><i><a href="http://schools.tdsb.on.ca/OakwoodCI">http://schools.tdsb.on.ca/OakwoodCI</a></i></b>

## ***Department Policies***

### ***Success Plan***

1. Come to class every day, on time, with a pencil, eraser, ruler , scientific calculator and binder.
2. Listen to, and participate in, the lesson.
3. Complete the work assigned in class.
4. Ask for help when you need it.
5. Help your classmates.
6. Complete all evaluations to the best of your ability.

### ***Textbooks***

***If students are issued a textbook for use during the school year, they are expected to bring it to class each period. Replacement cost \$80***

### ***Evaluation***

***Evaluation takes a balanced approach (see above) to the 4 categories of achievement (K/U, T, C, A) and blends these so that most evaluation tasks include 2 or more of the categories. For purposes of simplification, the final mark will be calculated as follows:***

<b><i>Course Work, including: Tests, Assignments, etc. (K/U, T, C, A)</i></b>	<b><i>70%</i></b>
---	-------------------

<b><i>Culminating Activities (incl. Final Exam) (K/U, T, C, A)</i></b>	<b><i>30 %</i></b>
--	--------------------

***Teachers will communicate to students the approximate value of assignments and their placement in the evaluation chart.***

### ***Attendance, Punctuality and Work Habits***

***It is expected that students arrive punctually to all classes and that attendance is regular. When students are absent, it is the responsibility of the student to find out what was missed. This should be done at an appropriate time such as before school on the date of return. Students are not to disrupt the learning of others by catching up on missed work during class. This includes requests for missed/lost handouts. All such matters should be dealt with before class commences.***

***Homework will be assigned on a regular basis. Students are expected to demonstrate initiative and self-direction in their approach to homework. Failure to do homework will adversely affect a student's ability to achieve high marks.***

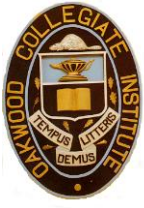
### **Coursework – Tests, Assignments, etc.**

**Students are expected to write tests/quizzes on the set date. Students must make arrangements with the teacher in advance of the test date if they know that they will be away. In such cases, the student is expected to make arrangements with their teacher to make up the missed evaluation. If students are absent for an officially recognized excuse, they must present documentation and the teacher will set a date for an alternative test to be written.**

**Assignments – each assignment has a due date. Assignments are due at the start of the period on the due date, unless otherwise specified. Late assignments will be accepted until the ultimate due date. This is usually the date on which marked assignments are returned. After this date, assignments may not be submitted and the student will receive a zero. Teachers may use a variety of techniques to encourage students to submit late work. This may include, if necessary, a mark reduction of 10%.**

### **Exams and Culminating Activities**

**Exams and culminating evaluations must be completed on the assigned date. It is usually not possible to reschedule these evaluations or to provide alternative assignments. Therefore a mark of zero will be assigned unless suitable documentation (medical certificate, etc.) is received. In such cases, the teacher, in consultation with colleagues and the administration, will determine an appropriate mark.**



*Oakwood Collegiate Institute*

*991 St. Clair Ave. West  
Toronto, Ontario M6E 1A3  
Telephone: (416) 393-1780  
Fax: (416) 393-8169*

*Website: <http://schools.tdsb.on.ca/oakwoodci/>*

***Course: Calculus and Vectors***

***Teacher: Nomura***

***Please acknowledge that you have read this outline:***

<b><i>Date:</i></b>	<b><i>Parent Signature</i></b>
<b><i>Date:</i></b>	<b><i>Student Signature</i></b>

Please return this to your teacher before the end of the week.