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|  | **Glendale Secondary School*****Mathematics Department* Course Outline 2015/2016***Calculus and Vectors MCV4U* |  |

**PREREQUISITE: MHF 4U** **HOURS:** 110 **CREDIT VALUE:** 1

**DEPARTMENT HEAD:** Mrs. R. Southern **TEXTBOOK:** McGraw Hill Calculus and Vectors 12

**REQUIRED MATERIALS**: Calculator, pencil, ruler and textbook

**GUIDELINE:** Ontario Curriculum Document 11 and 12

The text will be provided without charge. The student is responsible for returning the book in reasonable condition. The student will be charged for lost or damaged books. **Textbook replacement cost:** $90.00

**COURSE DESCRIPTION:**

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.

**STRANDS and OVERALL EXPECTATIONS:**

***Rate of Change***

* 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;

* 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;

* 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.

***Derivatives and Applications***

* 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;

* 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.

***Geometry and Algebra of Vectors***

* demonstrate an understanding of vectors in two-space and three-space by representing them algebraically and geometrically and by recognizing their applications;
* 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;
* 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;
* represent lines and planes using scalar, vector, and parametric equations, and solve problems involving distances and intersections*.*

***The primary purpose of assessment and evaluation is to improve student learning***

**ASSESSMENT**

The process of assessing student learning is continuous and on-going. Teachers use information gathered through assessments to provide feedback for students, to guide instruction and develop individual learning goals for students. This is assessment ***for*** learning. Students use this feedback to continuously improve their achievement and set individual learning goals. This is assessment ***as*** learning. Information from assessments informs the teacher’s professional judgment, but is not used in determining the student’s level of achievement.

**EVALUATION**

Evaluation is the process of determining a level of student achievement of the Overall Expectations for a course, which is recorded as a mid-term or final grade on a report card.

Students will be given numerous and varied opportunities to demonstrate their achievement of the Overall Expectations across the four categories of achievement (Knowledge & Understanding, Thinking, Communication and Application). Evidence of student achievement of the Overall Expectations is collected over time from three different sources – observations, conversations and student products.

To be successful students **must demonstrate achievement of EACH of the Overall Expectations** for the course. If a student is missing evidence of achievement of one or more of the Overall Expectations then a lower limit will be determined by the teacher.

In determining a report card grade teachers use their professional judgment to interpret the evidence of student achievement which reflects the student’s most consistent level of achievement with special considerations given to the more recent evidence.

The final grade is determined by the following breakdown:

**70 %** - evaluations made at the end of units throughout the semester.

**30%** - final demonstrations of learning (culminating activities and/or final examinations)

**REPORT CARDS**

Student progress is reported at 3 times during the semester.

**Interim Report** – October and March. Reports on student Learning Skills and Work Habits with next steps for improvement.

**Mid-term Report Card** – November and April. Reports on student achievement of the Overall Expectations to date. **Incomplete achievement** is reflected on Mid-term Report Cards, but replaced when learning has been demonstrated.

**Final Report Card** – February and July. Reports on student achievement of all of the Overall Expectations.

**ACADEMIC HONESTY**

Students are responsible for being academically honest in all aspects of their schoolwork. Academic dishonesty includes a variety of behaviours including cheating, plagiarism, facilitating or aiding academic dishonesty, and the unauthorized access or manipulating of student records, work and computer programs. Such behaviours impede the learning process and threaten the educational environment for all students.

Intentional academic dishonesty will result in disciplinary consequences. Teachers and parents should support students in striving for excellence and producing work with integrity.

**ATTENDANCE AND LEARNING SKILLS**

There is a direct link between good attendance and success at school. Students are expected to attend classes regularly and on time. Evidence of student achievement is gathered during classes through observations and learning conversations.

Learning Skills play an important role in a student’s level of achievement. Students will be assessed on the following learning skills: responsibility, independent work, collaboration, organization, initiative, and self-regulation.

**CELL PHONES/PERSONAL ELECTRONIC DEVICES**

Teachers will determine when personal electronic devices, including cell phones, will be used as instructional tools/supports. At other times these devices (with the exception of electronic translators) are not to be used and must be turned off and be stored away. Consequences for inappropriate use of these devices may include removal of the device from the learning environment.

**SCHOOL WIDE SUPPORTS**

* Student Support Team (formerly know as Learning Resource)
	+ In-class help
	+ Test and exam support
	+ Alternate learning environment
* English Language Learner Support Team
	+ Lunch-time help
	+ Test and exam support
* Math lunch-time help
* Math Homework Help – on-line support
* Information via school website @ <http://schools.hwdsb.on.ca/glendale/>
* School wide access to password protected wireless network
	+ Access to on-line resources
* Literacy Coaching
* Literacy @ Lunch
* Learning Commons @ Lunch
* Paper and electronic calendars
* Teacher/department Lunch-time/before/after school help

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|  | **Glendale Secondary School*****Mathematics Department* Course Outline 2015/2016***Gr 12 Calculus and Vectors MCV4U* |  |

**PREREQUISITE:** MHF4U **HOURS:** 110 **CREDIT VALUE:** 1

**DEPARTMENT HEAD:** Mrs. R. Southern **TEXTBOOK:** Calculus and Vectors 12 McGraw Hill Ryerson

**REQUIRED MATERIALS**: Calculator, pencil, ruler and textbook

**GUIDELINE:** Onatrio Ministry Documents Mathematics 11 and 12

The text will be provided without charge. The student is responsible for returning the book in reasonable condition. The student will be charged for lost or damaged books. **Textbook replacement cost:** $90.00

I am aware of the course expectations and the policies and supports put in place for the student to be successful.

**Student’s Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Department Head Name**: Mrs. R. Southern **Contact Number**: 905-560-7343 ext.

**Email:** rsouther@hwdsb.on.ca

Parent/ Guardian Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_