

Distance Education Course Outline for Calculus 30

GENERAL INFORMATION

- i. Calculus 12, February 1-June 23, 2018
- ii. Course is offered synchronously from 8:55-9:55am.
- iii. Teacher is Mr. Graham Farrell, Foam Lake Composite School
- iv. **The blackboard collaborate system on live.hzsd.ca will be utilized. Students are expected to be logged in daily from 8:53-9:55am. Their username varies according to location, but follows the pattern foamlake.school with a password that is their principal's name. For example...foamlake.school with password halyk. This takes them to the list of sessions. They login and click on the Graham Farrell's Calculus session for the day. If they are looking for a recording from earlier in the day or from an earlier recording, the student needs to go to the RECORDINGS tab and then pick the date of the recording they are looking for. In some cases, java security settings may need to be adjusted to allow for access. In these cases, please contact Mr. Farrell for instructions.**
- v. The school phone number is 306-272-3307 and email to Mr. Farrell is graham.farrell@hzsd.ca or cell phone number is 306-269-7525 to text.

COURSE DESCRIPTION

- i. This class follows the provincial curriculum for Calculus 12. A final exam will be administered to those students who do not earn a recommend according to Horizon School Division policy.
- ii. Math Pre-Cal 12 is a pre-requisite.

STUDENT LEARNING OUTCOMES:

- i. Students are required to explore new mathematical concepts as they relate to the study of Calculus. These concepts are an extension in many cases to concepts discovered/uncovered in Pre-Calculus 10, 11 and 12. As such, students must be open to delving into previous understandings and extending further. There is also a significant number of new concepts to be explored as they relate to the study of Calculus. The focus will be developing understandings that will serve the student well as s/he makes the bridge to post-secondary math classes that involve the study of differentiation and integration through historical development. Extending ideas like exponents and logs to include the natural logarithm and the Euler number from the common study of exponents and logs from Pre-Cal 12 would be an example of this bridging.

TEACHING STRATEGIES:

- i. The course design is suited to the student attending synchronously each day so that interaction can take place with the teacher and students in a number of schools at the same time. This allows for confirmation of concept attainment and guided practice to be effective.
- ii. A number of formative assessments are used for this class and there is an expectation that students complete daily assignments to reinforce learning. **Some** of the formative assessments are to be submitted upon completion by the host school contact, usually the secretary or school principal. The formative assessments allow the teacher to understand whether concept attainment is met. Once this is complete, a summative assessment of learning outcomes is completed at dates prescribed during the course. As mastery learning is to be gained by a large percentage of the class, unit exams take place at points throughout the course as set by the teacher and students in consultation.

The outcomes for the course are listed below with an approximate timeline included.

Topic/Concept/Theme	Dates	Major Objectives/Outcomes
Functions	February	30.1Extend understanding of functions including: <ul style="list-style-type: none"> • algebraic functions (polynomial, rational, power) • transcendental functions (exponential, logarithmic, trigonometric)

		<ul style="list-style-type: none"> • piecewise functions, including absolute value. <p>C30.2 Extend understanding of factoring, absolute value, and solving inequalities to include:</p> <ul style="list-style-type: none"> • rational expressions • double inequalities • absolute value inequalities.
Limits	February-March	C30.3 Demonstrate understanding of limits and continuity of functions.
Historical Differentiation	March	<p>C30.4 Demonstrate understanding of differentiation based on slope as a rate of change.</p> <p>C30.5 Extend understanding of curve sketching by applying differentiation and limits.</p>
Differentiation rules	March-April	C30.7 Demonstrate understanding of the rules of integration and then transition to more complex functions including transcendental function derivatives and their applications.
Applications	May	<p>C30.6 Demonstrate understanding of the application of derivatives to solve problems including:</p> <ul style="list-style-type: none"> • optimization • rates of change • related rates.
Integration	May-June	<p>C30.8 Demonstrate understanding of indefinite and definite integration:</p> <ul style="list-style-type: none"> • by sight • by substitution • as used in the Fundamental Theorem of Calculus.

COURSE MATERIALS

- i. The textbook is Calculus 30 by Burt Thiessen. It is available from Globe Printers in Saskatoon.

EVALUATION:

- i. Assessment is divided into formative assessments used to gauge student learning and a series of summative evaluations based on the testing of the learning success for each unit. The student mark is the mean of the set of summative assessments completed throughout the semester. For those students writing the final exam, the weight of the final exam will be 30%. If Johnny earns an average of 86% in the unit exams created by Mr. Farrell and scores 82% on the final exam developed by Mr. Farrell, then his final grade reported in the July transcripts will be...

$$(86\% \text{ of } 70 \text{ semester marks}) + (82\% \text{ of } 30 \text{ final exam marks}) = \text{Final Grade}$$

$$60.2 + 24.6 = \mathbf{84.8\%}$$

The locally developed final exam will be written during the exam week in June on a date that fits for the student and for the Principal of the student's host school.