CROCUS PLAINS REGIONAL SECONDARY SCHOOL
COURSE OUTLINE AND ASSESSMENT GUIDE

Course Name: Calculus 42S

Teacher's Name: **C. McLachlan**

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Course Description: **Calculus 42S**

Text/Other Resources: **Calculus: Graphical, Numerical, Algebraic**

Finney, Demana, Waits and Kennedy

Units of Study

Unit Title	Learning Outcomes	Assessment Plan	Proposed Time
The Definite Integral	Outcomes A to F in the chart below	<u>Formative Assessment</u> Assessment may include: daily work, observation, mental math <u>Summative Assessment</u> 2 quizzes, Chapter Test	17 days
Differential Equations and Mathematical Modeling	Outcomes A to F in the chart below	<u>Formative Assessment</u> Assessment may include: daily work, observation, mental math <u>Summative Assessment</u> 2 quizzes, Chapter Test	18 days
Applications of Definite Integrals	Outcomes A to F in the chart below	<u>Formative Assessment</u> Assessment may include: daily work, observation, mental math	9 days

		Summative Assessment Chapter Test	
Exam Review	Outcomes A to F in the chart below	<u>Formative Assessment</u> Assessment may include: daily work, observation, mental math <u>Summative Assessment</u> Advanced Placement Exam	12 days

Calculus 42S Outcome List:
Note: It is expected that students know all outcomes listed on the CAL41G outline as well.

Integrals

A. Interpretations and Properties of Definite Integrals

- Definite integral as a limit of Riemann sums.

- Definite integral of the rate of change of a quantity over an interval interpreted as the change of the quantity over the interval:

$$\int_a^b f'(x)dx = f(b) - f(a).$$

- Basic properties of definite integrals. (Examples include additivity and linearity.)

B. Applications of Integrals
Appropriate integrals are used in a variety of applications to model physical, biological, or economic situations. Although only a sampling of applications can be included in any specific course, students should be able to adapt their knowledge and techniques to solve other similar application problems. Whatever applications are chosen, the emphasis is on using the integral of a rate of change to give accumulated change or using the method of setting up an approximating Riemann sum and representing its limit as a definite integral. To provide a common foundation, specific applications should include finding the area of a region, the volume of a solid with known cross sections, the average value of a function, and the distance traveled by a particle along a line.

C. Fundamental Theorem of Calculus

- Use of the Fundamental Theorem to evaluate definite integrals.

- Use of the Fundamental Theorem to represent a particular antiderivative, and the analytical and graphical analysis of functions so defined.

D. Techniques of Antidifferentiation

- Antiderivatives following directly from derivatives of basic functions.

- Antiderivatives by substitution of variables (including change of limits for definite integrals).

E. Applications of Antidifferentiation

- Finding specific antiderivatives using initial conditions, including applications to motion along a line.

- Solving separable differential equations and using them in modeling. In particular, studying the equation $y' = ky$ and exponential growth.

F. Numerical Approximations to Definite Integrals
Use of Riemann sums (using left, right, and midpoint evaluation points) and trapezoidal sums to approximate definite integrals of functions represented algebraically, graphically, and by tables of values.

Assessment Guidelines

There are various purposes for assessment:

☐ Assessment *for* learning **(formative assessment)**: where assessment helps teachers gain insight into what students understand in order to plan and guide instruction, and provide helpful feedback to students.

☐ Assessment *of* learning **(summative assessment)**: where assessment informs students, teachers and parents, as well as the broader educational community, of achievement at a certain point in time in order to celebrate success, plan interventions and support continued progress.

Academic Achievement

Grades will be calculated on summative assessment information only. The final calculation will be a fair reflection of a student's achievement of the learning outcomes.

Term Work **100%**

> **Quizzes**

> **Tests**

Final Assessment ....
> **Students will write the Advanced Placement exam at the end of the course. This exam mark is not reflected on their transcript. The exam will take place on Monday, May 11, 2026.**

Learning Behaviours

Assessment and reporting of learning behaviors will be according to the Brandon School Division Learning Behaviors Rubric.