



**School of Arts & Science**  
**MATHEMATICS DEPARTMENT**  
**MATH 108**  
**Applied Calculus**  
**Fall 2014**

**Instructor:** Laura Teshima  
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**Website:** [Desire to Learn \(D2L\)](#)  
**Telephone:** (250) 370-3493  
**Timetable:**

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 am – 9:20 am	MATH 108-001 Room Y227	MATH 108-001 Room Y227	MATH 108-001 Room Y227	MATH 108-001 Room Y227	MATH 108-001 Room Y227
9:30 am – 10:20 am	Office Hour E254	Office Hour E254			Office Hour E254
10:30 am – 11:20 am	MATH 108-002 Room Y217	MATH 108-002 Room Y217	MATH 108-002 Room Y217	MATH 108-002 Room Y217	MATH 108-002 Room Y217
11:30 am – 12:20 pm			Office Hour E254	Office Hour E254	

**Important Dates:**

September 2	First day of class
September 16	Tuition fees due date
October 13	Thanksgiving - No classes
November 3	Withdrawal date deadline
November 11	Remembrance Day - No classes
December 5	Last day of class
December 8-16	Final exam period

**Calendar Description:** For students in biology, business, economics or the social sciences who require only one semester of calculus. Topics include limits, derivatives of algebraic, logarithmic, exponential and trigonometric functions, the definite and indefinite integral and integration by parts. [4 Credits]

(Source: Camosun College 2013-2014 Calendar  
[www.camosun.bc.ca/learn/calendar/current/web/math.html](http://www.camosun.bc.ca/learn/calendar/current/web/math.html))

**Prerequisites:** C+ in Pre-calculus 12 or Principles of Math 12; or C in MATH 105, MATH 107, MATH 115, MATH 174A, or MATH 185; or assessment. (Refer to the calendar for alternate prerequisites.)

**Note about Credit:** Only one of MATH 100 or MATH 108 may be used toward a Camosun College credential.

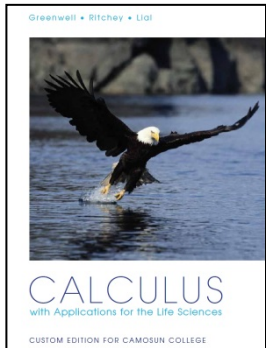
**Exit Grade:** A grade of at least C is required when this course is used as a prerequisite for entry into another Camosun course such as MATH 218.

**Required Textbook:**

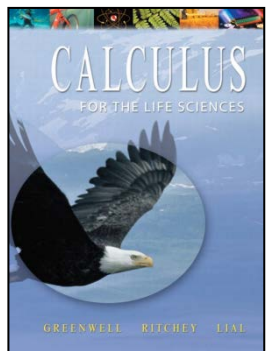
RN Greenwell, NP Ritchey and ML Lial, *Calculus with Applications for the Life Sciences*, Custom Edition for Camosun College, Pearson, 2003.

*Note: The custom edition of the textbook is a less expensive, paperback version of the regular 1<sup>st</sup> edition of the textbook with chapters 9, 10, 12 and 13 omitted as they are unneeded.*

**Course Content:**



custom edition



regular edition

**Chapter and Sections**

- R. Algebra Reference
    - R.1 Polynomials
    - R.2 Factoring
    - R.3 Rational Expressions
    - R.4 Equations
    - R.5 Inequalities
    - R.6 Exponents
    - R.7 Radicals
- reference/review sections*
1. Functions
    - 1.1 Lines and Linear Functions
    - 1.3 Properties of Functions
    - 1.4 Quadratic Functions; Translation and Reflection
    - 1.5 Polynomial and Rational Functions
  2. Exponential, Logarithmic, and Trigonometric Functions
    - 2.1 Exponential Functions
    - 2.2 Logarithmic Functions
    - 2.3 Applications: Growth and Decay
    - 2.4 Trigonometric Functions
  3. The Derivative
    - 3.1 Limits
    - 3.2 Continuity
    - 3.3 Rates of Change
    - 3.4 Definition of the Derivative
    - 3.5 Graphical Differentiation
  4. Calculating the Derivative
    - 4.1 Techniques for Finding Derivatives
    - 4.2 Derivatives of Products and Quotients
    - 4.3 The Chain Rule
    - 4.4 Derivatives of Exponential Functions
    - 4.5 Derivatives of Logarithmic Functions
    - 4.6 Derivatives of Trigonometric Functions
  5. Graphs and the Derivative
    - 5.1 Increasing and Decreasing Functions
    - 5.2 Relative Extrema
    - 5.3 Higher Derivatives, Concavity, and the Second Derivative Test
    - 5.4 Curve Sketching
  6. Applications of the Derivative
    - 6.1 Absolute Extrema
    - 6.2 Applications of Extrema
    - 6.3 Implicit Differentiation
    - 6.4 Related Rates
    - 6.5 Differentials: Linear Approximation
  7. Integration
    - 7.1 Antiderivatives
    - 7.2 Substitution
    - 7.3 Area and the Definite Integral
    - 7.4 The Fundamental Theorem of Calculus
    - 7.5 Integrals of Trigonometric Functions
    - 7.6 The Area Between Two Curves
  8. Further Techniques and Applications of Integration
    - 8.2 Integration by Parts
  11. Differential Equations
    - 11.1 Solutions of Elementary and Separable Differential Equations
- EXTRA: Newton's Method (class notes)

**Learning Outcomes:** The Intended Learning Outcomes for this course, as approved by the Education Council, are as follows. Upon completion of this course the student will be able to:

1. Find the limit of elementary functions as the independent variable approaches some finite value or approaches infinity.
2. Find the derivative of simple functions using the definition of the derivative.
3. Find the derivative of functions (polynomial, trigonometric, logarithmic and exponential functions) using the product, quotient and chain rule.
4. Find the derivative using implicit differentiation.
5. Solve problems involving rates of change.
6. Find relative and absolute extrema of functions.
7. Sketch graphs of functions identifying such features as relative extrema, intervals where the function is increasing and decreasing, points of inflection, intervals where the function is concave up and concave down, and asymptotes.
8. Solve problems that involve maximizing or minimizing some variable associated with the problem.
9. Find the approximate area under a curve using the area of a set of approximating rectangles.
10. Evaluate a definite and an indefinite integral of polynomial, trigonometric, logarithmic and exponential functions using the Fundamental Theorem of Calculus.
11. Evaluate integrals using the method of substitution.
12. Use integration to find the area between two curves.
13. Evaluate a definite and indefinite integral by the method of integration by parts.
14. Solve elementary differential equations using the method of separation of variables.
15. Solve problems using differential and integral calculus that involve applications from business and/or biological sciences.

**A&S Math Lab:** Ewing 224: This drop-in centre is freely available for your use to work on math homework and to seek help from the tutor on staff (see hours posted on door).

**Calculator Policy:** As per Math Department policy, the only calculator permitted for use on tests and the final exam is the Sharp EL-531 scientific calculator. No other make/model of calculator is permitted, nor are other electronic devices such as cell phones, iPods, electronic translators, etc.

**Homework:** It cannot be emphasized enough that practicing the mathematics that you learn in class is the most important thing you can do to be successful in this course. Your textbook contains practice problems at the end of each section, at a variety of difficulty levels, and many of these will be assigned for practice (but not graded) in the Recommended Practice Problems pdf on D2L. There will also be periodic assignments to be handed in for marking, details for which will be posted on the course website. Discussing mathematics problems with your peers is an excellent way to learn material and is actively encouraged; however, it is expected that your solutions to your assignments be written individually and in your own words. **Late assignments will not be accepted.**

**Quizzes:** Each Friday without a midterm, there will be an in-class quiz. These quizzes are open book, and you are encouraged to work with your classmates. However, each student must hand in his/her own solution, written in his/her own words. Of the nine quizzes, only each student's top seven scores will be recorded.

**Term Tests:** There will be three 50-minute term tests, each worth 10% of your grade. Additional details will be given in class. **There are no make-up tests.** If you miss a test for a valid reason such as illness, accident, or family affliction, you will be given an exemption from it provided that you notify me as soon as possible and provide support documentation (such as a note from a doctor or counsellor).

**Final Exam:** A comprehensive final exam will take place during the final exam period of December 8-16. The specific date, time, and location will be announced sometime in October. You must write the final exam at this time as per Camosun College's policy on final examinations. See [camosun.ca/learn/calendar/current/pdf/academic-policies.pdf](https://camosun.ca/learn/calendar/current/pdf/academic-policies.pdf).

**Grade Calculation:** The final grade will be calculated according to the following breakdown:

Assignments:	8%
Quizzes	12%
Term Tests:	30%
Comprehensive 3-hour Final Exam:	50%

**Grade Scale:** Final letter grades are assigned as follow:

0-49	50-59	60-64	65-69	70-72	73-76	77-79	80-84	85-89	90-100
F	D	C	C+	B-	B	B+	A-	A	A+

For information on Camosun College's grading policy, see Sec E-1.5 on the policy webpage [camosun.ca/about/policies/policies.html](https://camosun.ca/about/policies/policies.html).

**Support Services:** There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at [camosun.ca/services](https://camosun.ca/services).

**Student Conduct Policy:** There is a Student Conduct Policy which includes plagiarism. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services, and the College web site in the [Policy Section](#).