MATH 108
Calculus with Applications
Winter 2016

Instructor: Stephen Benecke
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Office Hours: MTWRF 10:30-1:30 (E254)

Course 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] Prerequisites: C+ in Pre-calculus 12 or Principles of Math 12; or C in MATH 107 or MATH 115; or assessment. (Refer to the calendar for alternate prerequisites.) Only one of MATH 100 or MATH 108 may be used toward a Camosun College credential.

Required Texts and Materials:
RN Greenwell, NP Ritchey & ML Lial, *Calculus with Applications for the Life Sciences*, [First or Second] Custom Edition for Camosun College, Pearson, [2003 or 2015].

Note: The custom edition of the textbook is a less expensive, paperback version of the regular edition of the textbook with chapters 9, 10, 12 and 13 omitted as they are not needed.

Note: Both the first and second custom editions will be accepted for the course..

Course Website
All relevant course information can be accessed via the course website. It is the student's responsibility to visit this website regularly, to stay informed of all course updates. Follow the relevant tab/link at **http://stephen.ministryofconstructions.com/math/**

Course Objectives:
At the end of this course, students 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.

Course Activities/Requirements:

Quizzes – 4x4%
Midterms – 4x8.5%
Final Exam - 50%

Proposed Course Outline:

Dates	Topic
Jan 11 – Jan 13	Algebra Review
Jan 14 – Jan 25	Functions
Jan 26 – Feb 4	Exponential, logarithmic and trigonometric functions
Feb 5 – Feb 15	The derivative
Feb 16 – Mar 1	Calculating the derivative
Mar 2 – Mar 11	Graphs and the derivative
Mar 14 – Mar 23	Applications of the derivative
Mar 24 – Apr 7	Integration
Apr 8 – Apr 14	Differential equations

More information is provided on the course website

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.

A&S Math Help Centre:

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).

Academic Integrity:

The Department of Mathematics and Statistics has available a *Student Guidelines for Academic Integrity* to help students interpret college policies involving conduct, academic dishonesty, plagiarism, etc. It is your responsibility to become familiar with the contents of the document and the college policies it references.

Grading System

The College Grading scale will be used in this course

This document is prepared before the beginning of the course. It is possible that some of the information in it will have to be modified before the course ends. Any such changes will be announced to the student in advance.