# COURSE OUTLINE

**The course description is online @ http://camosun.ca/learn/calendar/current/web/math.html**

Ω   *Please note:  the College electronically stores this outline for five (5) years only.*
*It is **strongly recommended** you keep a copy of this outline with your academic records.*
*You will need this outline for any future application/s for transfer credit/s to other colleges/universities.*

## 1.   Instructor Information

| | | | | |
|---|---|---|---|---|
| (a) | Instructor: | | | |
| (b) | Office Hours: | | | |
| (c) | Location: | | | |
| (d) | Phone: | | Alternative Phone: | |
| (e) | Email: | | | |
| (f) | Website: | | | |

## 2.   Intended Learning Outcomes      SEE BELOW

*(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)*

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.

## 3.   Required Materials

(a)   Texts

(b)   Other        SEE BELOW

## 4.   Course Content and Schedule
*(This section can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)*

## 5.   Basis of Student Assessment (Weighting)

*(This section should be directly linked to the Intended Learning Outcomes.)*

(a)  Assignments

(b)  Quizzes          **SEE BELOW**

(c)  Exams

(d)  Other (e.g., Attendance, Project, Group Work)

## 6.  Grading System
*(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College for approval.)*

### Standard Grading System (GPA)

| Percentage | Grade | Description | Grade Point Equivalency |
|---|---|---|---|
| 90-100 | A+ | | 9 |
| 85-89 | A | | 8 |
| 80-84 | A- | | 7 |
| 77-79 | B+ | | 6 |
| 73-76 | B | | 5 |
| 70-72 | B- | | 4 |
| 65-69 | C+ | | 3 |
| 60-64 | C | | 2 |
| 50-59 | D | Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite. | 1 |
| 0-49 | F | Minimum level has not been achieved. | 0 |

### Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

| Temporary Grade | Description |
|---|---|
| **I** | *Incomplete*:  A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family. |
| **IP** | *In progress*:  A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3$^{rd}$ course attempt or at the point of course completion.)* |
| **CW** | *Compulsory Withdrawal:*  A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement. |

## 7.  Recommended Materials or Services to Assist Students to Succeed Throughout the Course

### LEARNING SUPPORT AND SERVICES FOR STUDENTS

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.

### 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.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

**CAMOSUN COLLEGE**

# Mathematics 108
# Applied Calculus
## Fall, 2013

**Instructor:** George Ballinger
**Office:** Ewing 256
**E-mail:** ballinger@camosun.bc.ca
**Website:** ballinger.disted.camosun.bc.ca  (click the MATH 108 link for course information)
**Telephone:** (250) 370-3116
**Timetable:**

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 8:30 am – 9:20 am | MATH 108-001 Room Y217 | MATH 108-001 Room Y217 | MATH 108-001 Room Y217 | MATH 108-001 Room Y217 | MATH 108-001 Room Y217 |
| 9:30 am – 10:20 am | | | | | |
| 10:30 am – 11:20 am | Office Hour E256 | Office Hour E256 | Office Hour E256 | Office Hour E256 | Office Hour E256 |
| 11:30 am – 12:20 pm | MATH 100-002 Room Y217 | MATH 100-002 Room Y217 | MATH 100-002 Room Y217 | MATH 100-002 Room Y217 | MATH 100-002 Room Y217 |
| 12:30 pm – 1:20 pm | MATH 100-003 Room Y217 | MATH 100-003 Room Y217 | MATH 100-003 Room Y217 | MATH 100-003 Room Y217 | MATH 100-003 Room Y217 |
| 1:30 pm – 2:20 pm | | | | | |

**Important Dates:**

| | |
|---|---|
| September 3 | First day of class |
| September 17 | Tuition fees due date |
| October 14 | No class due to Thanksgiving Day holiday |
| October 17 | "ShakeOut" earthquake preparedness drill |
| November 4 | Withdrawal date deadline |
| November 11 | No class due to Remembrance Day holiday |
| December 6 | Last day of class |
| December 9-14, 16-17 | 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)

**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.)

**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.

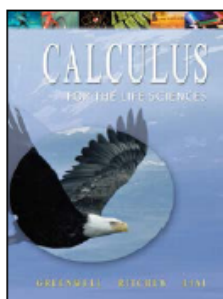| | |
|---|---|
| **Required Textbook:** | RN Greenwell, NP Ritchey and ML Lial, *Calculus with Applications for the Life Sciences*, Custom Edition for Camosun College, Pearson, 2003. |

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

**Course Content:**
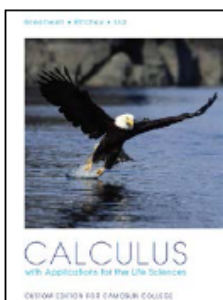


custom edition



regular edition

**Chapter and Sections**

R.  Algebra Reference   ⎫
  R.1   Polynomials
  R.2   Factoring
  R.3   Rational Expressions   ⎬  reference/review sections
  R.4   Equations
  R.5   Inequalities
  R.6   Exponents
  R.7   Radicals   ⎭
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.
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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:** | There will be periodic assignments to be handed in for marking, details for which will be posted on the course website. LATE ASSIGNMENTS WILL NOT BE ACCEPTED. |
| **Final Exam:** | A comprehensive final exam will take place during the final exam period of December 9-14, 16-17. 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. |

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

|  |  |
|---|---|
| Assignments*: | 15% |
| Term Tests: | 35% |
| Comprehensive 3-hour Final Exam: | 50% |

*Note:* The lowest assignment mark will be dropped when calculating the assignment average.  This allows you to miss one assignment without penalty.

**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.