CAMOSUN COLLEGE	**School of Arts & Science** **MATHEMATICS DEPARTMENT** **MATH 108 - 003** **APPLIED CALCULUS** **Winter 2016**

COURSE OUTLINE

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

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:	Garret Flowers		
(b)	Office Hours:	TBD		
(c)	Location:	TBD		
(d)	Phone:	250-813-3009	Alternative Phone:	
(e)	Email:	flowersg@camosun.bc.ca		
(f)	Website:	D2L (https://online.camosun.ca/d2l/home/85626)		

2. Intended Learning Outcomes

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

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

Calculator: As per Math Department policy, the only calculator permitted for use on tests and the final exam is the Sharp EL-531 (or EL-510R) scientific calculator. No other make/model of calculator is permitted, nor are other electronic devices such as cell phones, iPods, electronic translators,

4. Course Content and Schedule

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

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

5. Basis of Student Assessment (Weighting)

The final grade will be calculated based upon the following breakdown:

Assignments:	**14%**
3 Term Tests:	**36% (12% each)**
Comprehensive Final:	**50%**

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

Late Policy: You will be given ample time to complete the assignments. Late assignments will incur a 20% penalty, until the solutions are posted. At this point, late assignments will not be accepted.

Final Exam: The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar, “students are expected to write tests and final examinations at the scheduled time and place.” Exceptions will only be considered due to emergency circumstances as outlined in the calendar. The calendar specifically states that “holidays or scheduled flights are not considered to be emergencies.”

Collaboration: Students are very much encouraged to collaborate on assignments. However, you must be prepared to answer similar questions on your own for the tests. I recommend discussing the questions with your peers, but writing your final solutions on your own, to ensure you are familiar with the material.

6. Grading System

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 3rd 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.
The policy is available in each School Administration Office, at Student Services,
and the College web site in the Policy Section.