C A M O S U N C O L L E G E	**School of Arts & Science** **MATHEMATICS DEPARTMENT** **MATH 100** **Calculus 1** **Quarter or Semester/Year**

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:	Bogdan Verjinschi		
(b)	Office Hours:	TBA		
(c)	Location:	E244		
(d)	Phone:	3494	Alternative Phone:	
(e)	Email:	verjinschi@camosun.bc.ca		
(f)	Website:	http://verjinschi.disted.camosun.bc.ca		

2.   Intended Learning Outcomes
(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.   Define continuity.
3.   Find the derivative of simple functions using the definition.
4.   Find the derivative of functions (polynomial, trigonometric, logarithmic and exponential functions) using the product, quotient and chain rule.
5.   Find the derivative using implicit differentiation.
6.   Solve problems involving rates of change.
7.   Find relative and absolute extrema of functions.
8.   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.
9.   Solve problems that involve maximizing or minimizing some variable associated with the problem.
10. Solve equations using Newton's method.
11. Find the area under a curve using the limit of the area of a set of approximating rectangles.
12. Evaluate a definite and an indefinite integral of polynomial, trigonometric, logarithmic and exponential functions using the Fundamental theorem of Calculus.
13. Use the Mean Value Theorem of integrals to find the mean value of a continuous function.
14. Evaluate integrals using the method of substitution.
15. Evaluate definite integrals using the trapezoidal rule and Simpson's rule.
16. Solve elementary differential equations using the method of separation of variables.

3.   Required Materials

(a) Texts Ron Larson and Bruce H. Edwards, *Calculus of a Single Variable,* 10th Edition, Brooks/Cole, 2014.

Calculator Policy: *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, etc.*

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.)

Chapters and Sections

P. Preparation for Calculus
- P.1 Graphs and Models
- P.2 Linear Models and Rates of Change
- P.3 Functions and Their Graphs

1. Limits and Their Properties
- 1.1 A Preview of Calculus
- 1.2 Finding Limits Graphically and Numerically
- 1.3 Evaluating Limits Analytically
- 1.4 Continuity and One-Sided Limits
- 1.5 Infinite Limits

2. Differentiation
- 2.1 The Derivative and the Tangent Line Problem
- 2.2 Basic Differentiation Rules and Rates of Change
- 2.3 Product and Quotient Rules and Higher-Order Derivatives
- 2.4 The Chain Rule
- 2.5 Implicit Differentiation
- 2.6 Related Rates

3. Applications of Differentiation
- 3.1 Extrema on an Interval
- 3.2 Rolle's Theorem and the Mean Value Theorem
- 3.3 Increasing and Decreasing Functions and the First Derivative Test
- 3.4 Concavity and the Second Derivative Test
- 3.5 Limits at Infinity
- 3.6 A Summary of Curve Sketching
- 3.7 Optimization Problems
- 3.8 Newton's Method
- 3.9 Differentials

4. Integration
- 4.1 Antiderivatives and Indefinite Integration
- 4.2 Area
- 4.3 Riemann Sums and Definite Integrals
- 4.4 The Fundamental Theorem of Calculus
- 4.5 Integration by Substitution
- 4.6 Numerical Integration

5. Logarithmic, Exponential, and Other Transcendental Functions
- 5.1 The Natural Logarithmic Function: Differentiation
- 5.2 The Natural Logarithmic Function: Integration
- 5.3 Inverse Functions
- 5.4 Exponential Functions: Differentiation and Integration
- 5.5 Bases Other Than e and Applications

6. Differential Equations
- 6.2 Differential Equations: Growth and Decay
- 6.3 Separation of Variables and the Logistic Equation

5. Basis of Student Assessment (Weighting)

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

(a) Assignments (best 5 out of 6):   15%*

(b) 3 Term Tests: 30%
(c)Maple Labs: 5%

(d) Exam   50%

* *Note:* The lowest assignment mark will be dropped when calculating the assignment average. This allows you to miss one assignment without penalty. LATE ASSIGNMENTS ARE **NOT** ACCEPTED.

Homework: There will be 6 (six) assignments to be handed in for marking, details for which will be posted on the course website.

| **Maple Labs:** | Maple labs will take place in the computer lab Ewing 115 on the following dates: January 15, January 29, February 26, March 12, March 26, and April 9. |

| **Final Exam:** | A comprehensive final exam will take place during the final exam period of April 13-21. **You must write the final exam at the scheduled time as per Camosun College's policy on final examinations.** See camosun.ca/learn/calendar/current/pdf/academic-policies.pdf. |

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 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

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

Test / Assignment	Sections of Textbook	Test Date
TEST 1 **Assignment 1 & 2**	**Assignment 1** P.1 Graphs and Models P.2 Linear Models and Rates of Change P.3 Functions and Their Graphs 1.1 A Preview of Calculus 1.2 Finding Limits Graphically and Numerically 1.3 Evaluating Limits Analytically 1.4 Continuity and One-Sided Limits …………………………………………………………………………….. **Assignment 2** 1.5 Infinite Limits 2.1 The Derivative and the Tangent Line Problem 2.2 Basic Differentiation Rules and Rates of Change 2.3 Product and Quotient Rules and Higher-Order Derivatives 2.4 The Chain Rule	**February 2**
TEST 2 **Assignment 3 & 4**	**Assignment 3** 2.5 Implicit Differentiation 2.6 Related Rates 3.1 Extrema on an Interval 3.2 Rolle's Theorem and the Mean Value Theorem 3.3 Increasing and Decreasing Functions and the First Derivative Test 3.4 Concavity and the Second Derivative Test ………………………………………………………………………….. **Assignment 4** 3.5 Limits at Infinity 3.6 A Summary of Curve Sketching 3.7 Optimization Problems 3.8 Newton's Method 3.9 Differentials	**March 6**
TEST 3 **Assignment 5 & 6**	**Assignment 5** 4.1 Antiderivatives and Indefinite Integration 4.2 Area 4.3 Riemann Sums and Definite Integrals 4.4 The Fundamental Theorem of Calculus 4.5 Integration by Substitution 4.6 Numerical Integration ………………………………………………………………………… **Assignment 6** 5.1 The Natural Logarithmic Function: Differentiation 5.2 The Natural Logarithmic Function: Integration 5.3 Inverse Functions 5.4 Exponential Functions: Differentiation and Integration 5.5 Bases Other Than e and Applications	**April 8**
Assignment 7 **practice only**	*The final exam will also cover the following sections*: 6.2 Differential Equations: Growth and Decay 6.3 Separation of Variables and the Logistic Equation	