



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.*

Math 100 is a 4 credit course, offered in semester format of 5 lecture hours per week for 14 weeks.

Prerequisite: A grade of "B" in any of: Principles of Math 12, Pre-Calculus 12, or MATH 115; or a grade of "A" or higher in any of: MATH 107, or MATH 173; or assessment.

Credit can be obtained for only one of MATH 100 and 108.

1. Instructor Information

Instructor:	Dr. Patrick Montgomery
Office Hours:	Monday to Friday 9:30-10:20 and 1:30-2:20
Location:	Ewing 268 (Lansdowne Campus)
Phone:	250-370-3502
Email:	montgomeryp@camosun.bc.ca
D2L Website:	https://online.camosun.ca

2. Intended 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. 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) **Textbook:** : Ron Larson and Bruce H. Edwards, *Calculus of a Single Variable*, 10th Edition, Brooks/Cole, 2014. Available at the Camosun bookstore for \$126.75.
- (b) **Calculator:** As per Math Department policy, the only calculator permitted for use on the tests and the final exam is the **Sharp EL-531X** (or the discontinued EL-531W) scientific calculator. No other make/model of calculator is permitted, nor are other electronic devices such as cell phones, iPods, electronic translators, etc.. Available at the Camosun bookstore for \$16.99

4. Course Content and Schedule

The course objectives correspond to approximately half of the textbook, with the sections covered below.

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

An approximate pacing schedule is in the table below.

Classes are lecture style, meeting Monday through Friday in room E346 from 8:30-9:20

Week	Dates	Monday	Tuesday	Wednesday	Thursday	Friday
1	Jan 11-15	P.1	P.2	P.3	1.1	1.2, HW 1
2	Jan 18-22	1.3	1.4	Lab 1	1.4	1.5, HW 2
3	Jan 25-29	2.1	2.1	2.2	2.3	2.4, HW 3
4	Feb 1-5	2.4	Test 1	Lab 2	2.5	2.6, HW 4
5	Feb 8-12	Family Day	2.6	3.1	3.2	3.2, HW 5
6	Feb 15-19	3.3	3.3	Lab 3	Reading Break	Reading Break
7	Feb 22-26	3.4	3.4	3,5	3.6	3.6, HW 6
8	Feb 29-Mar 4	3.7	Test 2	Lab 4	3.8	3.8, HW 7
9	Mar 7-11	3.9	4.1	4.1	4.2	4.2, HW 8
10	Mar 14-18	4.3	4.3	Lab 5	4.4	4.4, HW 9
11	Mar 21-25	4.5	4.5	4.6	5.1	Good Friday
12	Mar 28-Apr 1	Easter Monday	5.2	Lab 6	5.2	5.3, HW 10
13	Apr 4-8	5.4	Test 3	5.4	5.5	6.2, HW 11
14	Apr 11-15	6.2	6.3	6.3	Review	Review

Math Labs: Every second week on Wednesday, class will be held in Ewing 115 (computer lab) where we will use a computer algebra system (Maple) to help achieve the learning objectives of the course.

Resources: Math Support Centre (Ewing 224) is a drop-in service where you can get help with your math homework. The hours will be posted on the door.

5. Basis of Student Assessment (Weighting)

- (a) Homework – 15% (note only the best 10 of 11 HW assignments will be used)
- (b) Maple Labs – 5%
- (c) Three in class tests – 30%
- (d) Comprehensive Final exam: 50%

Homework is to be handed in by the end of class on Fridays (except the holidays of February 19 and March 25)

Grades will be assigned with the 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	<i>Incomplete:</i> 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	<i>In progress:</i> 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. <i>(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)</i>
CW	<i>Compulsory Withdrawal:</i> 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.

6. 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 you throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at <http://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.

Math Labs: Ewing 342 & 224 (LANS) and Tec142 (INT): These drop-in centres are available for you to work on math homework and to seek free help from the tutor on staff. See the hours posted on the math lab doors (most current) or go to <http://camosun.ca/services/help-centres/math-access.html>

Dr. Montgomery's Teaching Philosophy

I believe...	I will...	I expect you to...
education is important	<ul style="list-style-type: none"> - take teaching seriously - be prepared for classes - be available to help - look for answers to questions that I may not be able to answer promptly 	<ul style="list-style-type: none"> - be committed to learning - never give up, persevere
an organized class helps with learning	<ul style="list-style-type: none"> - start on time - inform you of changes promptly - maintain a course website 	<ul style="list-style-type: none"> - be in class and ready when we start - read the textbook - inform me if you are unable to complete an assignment or test on schedule
curiosity enhances learning	<ul style="list-style-type: none"> - ask questions to provoke thought - share stories and experiences - provide challenges to give you the opportunity to think deeply - be enthusiastic and excited about mathematics 	<ul style="list-style-type: none"> - foster your own lifelong enjoyment of learning - ask questions of me, your peers, and yourself - look outside the curriculum for connections - share your experiences with others
in an environment of personal respect	<ul style="list-style-type: none"> - at all times be courteous and polite - behave in a way that makes you feel at ease in the classroom 	<ul style="list-style-type: none"> - maintain behavior that does not disrupt learning - inform me of issues which are affecting your classroom learning
practice is key to performance	<ul style="list-style-type: none"> - assign homework - provide prompt and constructive feedback 	<ul style="list-style-type: none"> - complete your homework assignments on time - use my feedback to improve your skills