



**CAMOSUN COLLEGE**  
**School of Arts & Science**  
**Department of Mathematics & Statistics**

**MATH-101-002**  
**Calculus 2**  
**Winter 2019**

**COURSE OUTLINE**

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

*Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.*

**1. Instructor Information**

<b>(a) Instructor</b>	George Ballinger	
<b>(b) Office hours</b>	Mon-Fri, 11:30am-12:20pm	
<b>(c) Location</b>	E260	
<b>(d) Phone</b>	250-370-3116	<b>Alternative:</b> n/a
<b>(e) E-mail</b>	ballinger@camosun.bc.ca	
<b>(f) Website</b>	georgeballinger.ca (click the <a href="#">MATH 101</a> link for course information)	

**Timetable:**

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 am – 9:20 am	MATH 251-X03 Room Y227	MATH 251-X03 Room Y227	MATH 251-X03 Room Y227	MATH 251-X03 Room Y227	MATH 251-X03 Room Y227
9:30 am – 10:20 am	MATH 101-003 Room Y227	MATH 101-003 Room Y227	MATH 101-003 Room Y227	MATH 101-003 Room Y227	MATH 101-003 Room Y227
10:30 am – 11:20 am					
11:30 am – 12:20 pm	Office Hour E260	Office Hour E260	Office Hour E260	Office Hour E260	Office Hour E260
12:30 pm – 1:20 pm					
1:30 pm – 2:20 pm	MATH 101-002 Room Y227	MATH 101-002 Room Y227	MATH 101-002 Room Y227	MATH 101-002 Room Y227	MATH 101-002 Room Y227
2:30 pm – 3:20 pm		A&S Chairs Meeting			
3:30 pm – 4:20 pm					

**2. Intended Learning Outcomes**

Upon completion of this course the student will be able to:

1. Differentiate and integrate inverse trigonometric, hyperbolic and inverse hyperbolic functions.

2. Use integration to find area, volume, arc length, surface area of revolution, work, moments and centroids.
3. Integrate using parts, trigonometric integrals, trigonometric substitution, partial fractions and tables.
4. Evaluate limits, which have indeterminate forms, and calculate improper integrals.
5. Test a sequence for convergence and explain the difference between convergence of a sequence and convergence of a series.
6. Test series for convergence using the integral test, p-test, comparison tests, alternating series test and ratio test and explain the difference between convergence and absolute convergence.
7. Estimate the error in approximating a series using improper integrals and the alternating series remainder.
8. Calculate Taylor polynomials, power series, Taylor series, and MacLaurin series and estimate the error in an approximation using Taylor's Theorem.
9. Determine the interval of convergence of a power series.
10. Graph and analyze parametric curves and find arc length and surface area in parametric form.
11. Graph and analyze curves given in polar coordinates and determine area and arc length in polar form.

### 3. Required Materials

**Textbook:** Ron Larson and Bruce Edwards, *Calculus of a Single Variable*, 11th Edition, Nelson (Cengage), 2018.

### 4. Course Content and Schedule

<b>Important Dates:</b>	January 7	First day of class
	January 18	Add course deadline
	January 21	Fee deadline
	January 21	Drop course with tuition refund deadline
	February 18	Family Day (no class)
	February 19-22	Reading Break (no class)
	March 13	Withdrawal deadline
	April 12	Last day of class
	April 15-18	Final exam period (part 1 of 2)
	April 19	Good Friday (no exams)
	April 22	Easter Monday (no exams)
	April 23-26	Final exam period (part 2 of 2)

**Calendar Description:** A continuation of MATH 100. Topics include: inverse and hyperbolic trigonometric functions, applications of integration, integration techniques, L'Hôpital's Rule, improper integrals, infinite series, Taylor series, parametric equations and polar coordinates. ~~Students will complete some assignments using Maple.~~ [4 Credits]

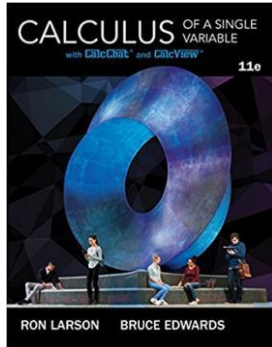
(Source: Camosun College Calendar  
[camosun.ca/learn/calendar/current/web/math.html#MATH101](http://camosun.ca/learn/calendar/current/web/math.html#MATH101))

**Prerequisites:** C in MATH 100 or A in MATH 108.

**Exit Grade:** A grade of at least C (60%) is required when this course is used as a prerequisite for entry into MATH 220, MATH 226 or any other Camosun course.

**Course Content:** **Chapters and Sections**

5. Logarithmic, Exponential, and Other Transcendental Functions
  - 5.6 Indeterminate Forms and L'Hôpital's Rule
  - 5.7 Inverse Trigonometric Functions: Differentiation
  - 5.8 Inverse Trigonometric Functions: Integration
  - 5.9 Hyperbolic Functions
7. Applications of Integration
  - 7.1 Area of a Region Between Two Curves
  - 7.2 Volume: The Disk Method



- 7.3 Volume: The Shell Method
- 7.4 Arc Length and Surfaces of Revolution
- 7.5 Work
- 7.6 Moments, Centers of Mass, and Centroids
- 7.7 Fluid Pressure and Fluid Force
- 8. Integration Techniques and Improper Integrals
  - 8.1 Basic Integration Rules
  - 8.2 Integration by Parts
  - 8.3 Trigonometric Integrals
  - 8.4 Trigonometric Substitution
  - 8.5 Partial Fractions
  - 8.7 Integration by Tables and Other Integration Techniques
  - 8.8 Improper Integrals
- 9. Infinite Series
  - 9.1 Sequences
  - 9.2 Series and Convergence
  - 9.3 The Integral Test and p-Series
  - 9.4 Comparisons of Series
  - 9.5 Alternating Series
  - 9.6 The Ratio and Root Tests
  - 9.7 Taylor Polynomials and Approximations
  - 9.8 Power Series
  - 9.9 Representation of Functions by Power Series
  - 9.10 Taylor and Maclaurin Series
- 10. Conics, Parametric Equations, and Polar Coordinates
  - 10.1 Conics and Calculus
  - 10.2 Plane Curves and Parametric Equations
  - 10.3 Parametric Equations and Calculus
  - 10.4 Polar Coordinates and Polar Graphs
  - 10.5 Area and Arc Length in Polar Coordinates

**Academic Integrity:**

The Department of Mathematics and Statistics has prepared a handout called [Student Guidelines for Academic Integrity](#) to help you interpret college policies involving student conduct, academic dishonesty, plagiarism, etc. It is your responsibility to become familiar with the contents of the document and the college policies it references.

**Calculator Policy:**

As per 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 calculator or any other electronic device including cell phones, electronic translators, smartwatches, iPods, etc. is allowed.

**Homework:**

There will be periodic assignments to be handed in for marking. Collaboration with your classmates is permitted, but you must submit your own work. LATE ASSIGNMENTS WILL NOT BE ACCEPTED.

**Tests:**

If you miss a test for a legitimate reason such as illness, accident or family affliction, you should notify me *as soon as possible* and provide supporting documentation. There will be no "make-up" tests. In the event of an excused absence, the mark from your final exam, or relevant subset thereof, will replace your test mark.

**Final Exam:**

A comprehensive, 3-hour final exam will take place during the final exam period of April 15-18, 23-26. The specific date, time, and location will be announced on or about February 22. 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/procedures.html#academic](http://camosun.ca/learn/calendar/current/procedures.html#academic).

## 5. Basis of Student Assessment (Weighting)

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

Assignments:	15%*
Term Tests:	35%
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.

## 6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

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

**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 instructional assistant. Hours are posted on the door or online at [camosun.ca/services/help-centres/#MATH](http://camosun.ca/services/help-centres/#MATH).

## 8. College Supports, Services and Policies



### Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

### College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

## **A. GRADING SYSTEMS** <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

### 1. 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		1
0-49	F	Minimum level has not been achieved.	0

### 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

## B. 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 at <http://camosun.ca/about/policies/index.html> 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 are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
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.