



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

**MATH-250A-X01**  
**Intermediate Calculus 1**  
**Winter 2020**

**COURSE OUTLINE**

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

$\Omega$  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.

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**1. Instructor Information**

(a) Instructor	Gilles Cazelais
(b) Office hours	<a href="https://sites.google.com/site/cazelais/">https://sites.google.com/site/cazelais/</a>
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(f) Website	<a href="https://sites.google.com/site/cazelais/home/math250a">https://sites.google.com/site/cazelais/home/math250a</a>

**2. Intended Learning Outcomes**

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

1. Differentiate inverse trig functions.
2. Integrate polynomials, trigonometric and inverse trigonometric functions, and exponential and logarithmic functions.
3. Evaluate limits of indeterminate forms, and calculate improper integrals.
4. Use integration to find area, volume, arc length, surface area of revolution, work, moments and centroids.
5. Integrate using substitution, parts, trigonometric integrals, trigonometric substitution, and partial fractions.
6. Test a sequence for convergence and explain the difference between convergence of a sequence and convergence of a series.
7. 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.
8. Estimate the error in approximating a series using improper integrals and the alternating series remainder.
9. Calculate Taylor polynomials, power series, Taylor series, and MacLaurin series and estimate the error in an approximation using Taylor's Theorem.
10. Determine the interval of convergence of a power series.
11. Graph and analyze parametric and polar curves and find their first and second derivatives.
12. Perform integration computations with parametric and polar curves to compute area, arc-length, volume and surface area.
13. Sketch, differentiate, and integrate vector-valued functions to find velocities, accelerations, tangents, and normals.

**3. Required Materials**

Textbook: Calculus (11th Edition) by Larson and Edwards.

## 4. Course Content and Schedule

### 1. Review

Limits and Continuity (1.2 - 1.5)

Differentiation Rules (2.2 - 2.5)

Integration (4.4, 4.5)

Logarithmic, Exponential, and Other Transcendental Functions (5.1 - 5.8)

### 2. Integration Techniques, L'Hopital's Rule, and Improper Integrals

Basic Integration Rules (8.1)

Integration by Parts (8.2)

Trigonometric Integrals (8.3)

Trigonometric Substitution (8.4)

Partial Fractions (8.5)

Integration by Tables and Other Integration Techniques (8.7)

Indeterminate Forms and L'Hopital's Rule (5.6)

Improper Integrals (8.8)

### 3. Infinite Series

Sequences (9.1)

Series and Convergence (9.2)

The Integral Test and p-Series (9.3)

Comparisons of Series (9.4)

Alternating Series (9.5)

The Ratio and Root Tests (9.6)

Taylor Polynomials and Approximations (9.7)

Power Series (9.8)

Representation of Functions by Power Series (9.9)

Taylor and Maclaurin Series (9.10)

### 4. Conics, Parametric Equations, and Polar Coordinates

Conics and Calculus (10.1)

Plane Curve and Parametric Equations (10.2)

Parametric Equations and Calculus (10.3)

Polar Coordinates and Polar Graphs (10.4)

Area and Arc Length in Polar Coordinates (10.5)

### 5. Vectors and Geometry of Space

Read sections 11.1 - 11.5. This material is covered in Math 251.

### 6. Vector-Valued Functions

Vector-Valued Functions (12.1)

Differentiation and Integration of Vector-Valued Functions (12.2)

Velocity and Acceleration (12.3)

Tangent and Normal Vectors (12.4)

Arc-length and Curvature (12.5)

## 5. Basis of Student Assessment (Weighting)

Four term tests: 50%

Final Exam: 50%

Tentative Schedule

Test 1 January 30 Test 2 February 27

Test 3 March 12 Test 4 April 2

Final exams are held from April 14 - 22. You must be available at the scheduled time.

## 6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

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

Wolfram Alpha: <https://www.wolframalpha.com/>

Desmos: <https://www.desmos.com/>

## 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.