



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

MATH-250A-X02
Intermediate Calculus 1
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

| | |
|-------------------------|---|
| (a) Instructor | Gilles Cazelais |
| (b) Office hours | https://sites.google.com/site/cazelais/ |
| (c) Location | CBA 158 |
| (d) Phone | 250-370-4495 |
| (e) E-mail | Cazelais@camosun.bc.ca |
| (f) Website | https://sites.google.com/site/cazelais/home/math250a |

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

Edwards and Penney, *Calculus Early Transcendentals*, 7th edition.

4. Course Content and Schedule

1. Review

- Limits and Continuity (2.2 - 2.4)
- Differentiation Rules (3.2 - 3.4)
- Trigonometric, Logarithmic, and Exponential, Functions (3.7 - 3.8)
- Implicit Differentiation (3.9)
- Integration (5.6 - 5.8)
- Inverse Trigonometric Functions (6.8)

2. Limits

- Indeterminate Forms and l'Hopital's Rule (4.8)
- More Indeterminate Forms (4.9)

3. Integration Techniques, l'Hopital's Rule, and Improper Integrals

- Integral Tables and Simple Substitutions (7.2)
- Integration by Parts (7.3)
- Trigonometric Integrals (7.4)
- Rational Functions and Partial Fractions (7.5)
- Trigonometric Substitution (7.6)
- Integral Involving Quadratic Polynomials (7.7)
- Improper Integrals (7.8)

4. Polar Coordinates and Parametric Curves

- Analytic Geometry and the Conic Sections (9.1)
- Polar Coordinates (9.2)
- Area Computations in Polar Coordinates (9.3)
- Parametric Curves (9.4)
- Integral Computations with parametric Curves (9.5)
- Conic Sections and Applications (9.6)

5. Infinite Series

- Introduction (10.1)
- Infinite Sequences (10.2)
- Infinite Series and Convergence (10.3)
- Taylor Series and Polynomials (10.4)
- The Integral Test (10.5)
- Comparison Tests for Positive-Term Series (10.6)
- Alternating Series and Absolute Convergence (10.7)
- Power Series (10.8)
- Power Series Computation (10.9)

6. Vectors and Curves

- Vectors in the Plane (11.1)
- Three-Dimensional Vectors (11.2)
- The Cross Product of Vectors (11.3)
- Lines and Planes in Space (11.4)
- Curves and Motion in Space (11.5)
- Curvature and Acceleration (11.6)

5. Basis of Student Assessment (Weighting)

- (a) Four tests 50%
- (b) Final exam 50%

6. Grading System

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

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

The Math Lab in TEC 142 has a tutor on staff. Hours are posted on the door.

www.wolframalpha.com and www.desmos.com have excellent free graphing software

www.khanacademy.org has many good video lectures

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. |