# 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: | George Ballinger | | |
|---|---|---|---|---|
| (b) | Office Hours: | See below | | |
| (c) | Location: | E256 | | |
| (d) | Phone: | 250-370-3116 | Alternative Phone: | N/A |
| (e) | Email: | ballinger@camosun.bc.ca | | |
| (f) | Website: | ballinger.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.   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

(a)   Texts

(b)   Other

SEE BELOW

## 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.)*

SEE BELOW

## 5.   Basis of Student Assessment (Weighting)
*(This section should be directly linked to the Intended Learning Outcomes.)*

(a)   Assignments

SEE BELOW

(b) Quizzes

(c) Exams

(d) Other (e.g., Attendance, Project, Group Work)

**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**

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.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

# Mathematics 101
## Calculus 2
### Winter, 2016

| | |
|---|---|
| **Instructor:** | George Ballinger |
| **Office:** | Ewing 256 |
| **E-mail:** | ballinger@camosun.bc.ca |
| **Website:** | ballinger.disted.camosun.bc.ca  (click the MATH 101 link for course information) |
| **Telephone:** | (250) 370-3116 |
| **Timetable:** | |

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 8:30 am – 9:20 am | | | | | |
| 9:30 am – 10:20 am | | | | | |
| 10:30 am – 11:20 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 |
| 11:30 am – 12:20 pm | Office Hour E256 | Office Hour E256 | Office Hour E256 | Office Hour E256 | Office Hour E256 |
| 12:30 pm – 1:20 pm | MATH 101-002 Room E346 | MATH 101-002 Room E346 | MATH 101-002 Room E346 | MATH 101-002 Room E346 | MATH 101-002 Room E346 |
| 1:30 pm – 2:20 pm | | | | | |
| 2:30 pm – 3:20 pm | | A&S Chairs Meeting | | | |
| 3:30 pm – 4:20 pm | | | | | |
| 4:30 pm – 5:20 pm | MATH 126-001 Room Y227 | MATH 126-001 Room Y227 | MATH 126-001 Room Y227 | MATH 126-001 Room Y227 | |

**Important Dates:**

| | |
|---|---|
| January 11 | First day of class |
| January 25 | Fee deadline |
| February 8 | Family Day (no class) |
| February 18-19 | Reading Break (no class) |
| March 14 | Withdrawal deadline |
| March 25 | Good Friday (no class) |
| March 28 | Easter Monday (no class) |
| April 15 | Last day of class |
| April 18-23, 25-26 | Final exam period |

**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 2015-2016 Calendar camosun.ca/learn/calendar/current/web/math.html*)

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| | |
|---|---|
| **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. |
| **Required Textbook:** | Ron Larson and Bruce H. Edwards, *Calculus of a Single Variable,* 10th Edition, Brooks/Cole, 2014. |

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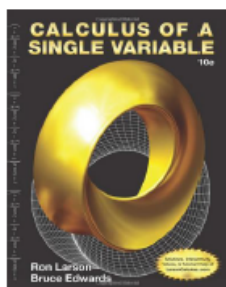
**Chapters and Sections**

5. Logarithmic, Exponential, and Other Transcendental Functions
    5.6   Inverse Trigonometric Functions:  Differentiation
    5.7   Inverse Trigonometric Functions:  Integration
    5.8   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, L'Hôpital's Rule, 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
    8.6   Integration by Tables and Other Integration Techniques
    8.7   Indeterminate Forms and L'Hôpital's Rule
    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

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| | |
|---|---|
| **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. 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.
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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.

| | |
|---|---|
| **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 tutor on staff (see hours posted on door). |
| **Support and Services:** | There are a variety of learning support and services available that can assist you throughout your learning. For more information please see camosun.ca/services. |
| **Academic Integrity:** | The Department of Mathematics and Statistics has prepared a red 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, nor any other electronic device including cell phones, electronic translators, iPods, etc., is allowed. |
| **Homework:** | There will be periodic assignments to be handed in for marking, details for which will be posted on the course website. LATE ASSIGNMENTS WILL NOT BE ACCEPTED. |
| **Final Exam:** | A comprehensive, 3-hour final exam will take place during the final exam period of April 18-23, 25-26. The specific date, time, and location will be announced on or about February 19. 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. |

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**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.

**Grade Scale:**    Final letter grades are assigned as follow:

| 0-49 | 50-59 | 60-64 | 65-69 | 70-72 | 73-76 | 77-79 | 80-84 | 85-89 | 90-100 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| F | D | C | C+ | B− | B | B+ | A− | A | A+ |

For information on Camosun College's grading policy, see policy E-1.5 on the webpage camosun.ca/about/policies/policies.html#education.

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