CAMOSUN COLLEGE	**School of Arts & Science** **Department of Mathematics and Statistics** **MATH 101-001** **Calculus 2** **2016 Winter**

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

Prerequisite: A grade of "C" or higher in MATH 100; or a grade of "A" or higher in any of: MATH 108; or assessment.

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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

Calendar Course 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

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.
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) **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

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

An approximate pacing schedule is in the table below.

Classes are lecture style, meeting Monday through Friday in room Y325 from 2:30-3:20

Week	Dates	Monday	Tuesday	Wednesday	Thursday	Friday
1	Jan 11-15	Intro	5.6	5.7	5.7	5.8
2	Jan 18-22	5.8	7.1, HW 1	7.1	7.2	7.2
3	Jan 25-29	7.3	7.3, HW 2	7.4	7.4	7.5
4	Feb 1-5	7.6	7.7, HW 3	8.1	8.2	Test 1 (HW 1-3)
5	Feb 8-12	Family Day	8.2, HW 4	8.3	8.3	8.4
6	Feb 15-19	8.4	8.5, HW 5	8.5	Reading Break	Reading Break
7	Feb 22-26	8.6	8.7, HW 6	8.7	8.8	8.8
8	Feb 29-Mar 4	9.1	9.1, HW 7	9.2	9.2	Test 2 (HW 4-7)
9	Mar 7-11	9.3	9.3, HW 8	9.4	9.5	9.5
10	Mar 14-18	9.6	9.6, HW 9	9.7	9.7	9.8
11	Mar 21-25	9.8	9.9, HW 10	9.9	9.10	Good Friday
12	Mar 28-Apr 1	Easter Monday	9.10, HW 11	10.1	10.1	Test 3 (HW 8-11)
13	Apr 4-8	10.2	10.2, HW 12	10.3	10.3	10.4
14	Apr 11-15	10.4	10.5, HW 13	10.5	Review	Review

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 – 20% (note only the best 12 of 13 HW assignments will be used)
(b) Three in class tests – 30%
(c) Comprehensive Final exam: 50%

Homework is to be handed in by the end of class on Tuesdays

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	*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.

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

I believe…	I will…	I expect you to…
education is important	- 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	- be committed to learning - never give up, persevere
an organized class helps with learning	- start on time - inform you of changes promptly - maintain a course website	- 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	- 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	- 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	- at all times be courteous and polite - behave in a way that makes you feel at ease in the classroom	- maintain behavior that does not disrupt learning - inform me of issues which are affecting your classroom learning
practice is key to performance	- assign homework - provide prompt and constructive feedback	- complete your homework assignments on time - use my feedback to improve your skills