CAMOSUN COLLEGE	**School of Arts & Science** **Department of Mathematics and Statistics** **MATH 115-002** **Pre-Calculus** **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 115 is a 4 credit course, offered in semester format of 6 lecture hours per week for 14 weeks.

*Prerequisite: A grade of "B" in any of: Principles of Math 11, Pre-Calculus 11, MATH 073, MATH 092, or MATH 137; **or** a grade of "C" in any of: Principles of Math 12, Pre-Calculus 12, MATH 093, MATH 105, MATH 107 or MATH 173.*

Credit cannot be obtained for only one of MATH 105, 107, or 115.

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

General description: This course provides excellent preparation for MATH 100, Calculus 1. Topics include polynomial, rational, exponential, logarithmic, trigonometric and inverse trigonometric functions; sequences and series; and a brief introduction to calculus.

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

1. Read and write mathematics at a level sufficient for entry into first-year calculus.
2. Write equations of circles and ellipses in standard form and graph these relations. Expand binomials using Pascal's triangle. Factor and simplify expressions with rational exponents. Solve polynomial and rational inequalities. State the Remainder, Factor and Rational Zeros Theorems and use these theorems to factor polynomials and find their real zeros.
3. Define the term function. Find the domain of functions. Compose and decompose functions. Construct algebraic functions to model simple real-life problems. Solve optimization problems modelled with quadratic functions.
4. Identify the graphs of common algebraic functions. Evaluate and graph piecewise defined functions. Interpret and graph multiple transformations of functions. Analyze and graph polynomial and rational functions.
5. Find inverse functions algebraically and graphically. Explain the relationship between exponential and logarithmic functions. Graph exponential and logarithmic functions and their transformations. Prove the properties of logarithms and use these properties to simplify expressions and solve equations. Solve applied problems involving pH, the Richter scale, decibels, compound interest, exponential growth, exponential decay and logistic growth.
6. State the right triangle definitions for the trigonometric functions. Use reference triangles to find exact values of trigonometric functions of special angles. Define a radian and work with radian measure. State the unit circle definitions for the sine and cosine functions. Graph the six trigonometric functions and transformations of these functions. Analyze sinusoidal graphs and construct possible equations. Graph the inverse sine, cosine and tangent functions. Find exact values for compositions of trigonometric and inverse trigonometric functions. Write compositions as algebraic expressions.
7. Derive the Pythagorean identities, the sum and difference identities, the double angle identities, the power reducing identities, and the half angle identities. Use these identities to simplify expressions and verify other identities. Find exact and approximate solutions of trigonometric equations, including equations involving identities and multiples of angles.

8. Identify patterns in sequences and write formulas for the general terms. Simplify and evaluate basic sums of sequences. Derive formulas for the nth terms of arithmetic and geometric sequences and for the sums of the first n terms of these sequences. Solve word problems involving arithmetic and geometric sequences and series.
9. Evaluate limits graphically, numerically and algebraically. Use the definition of a derivative to differentiate basic polynomial, rational and radical functions. Differentiate polynomials using standard rules. Demonstrate an understanding of both the geometrical and physical interpretations of derivatives.

3. Required Materials

(a) **Textbook:** *Algebra and Trigonometry, S*ullivan, 2nd custom edition, with solutions manual. Available at the Camosun bookstore for $175.05.

(b) **Calculus supplement:** Available online (see the D2L website.)

(c) **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 most of the textbook, with some supplementary material available online. The specific sections of the textbook to be covered, along with an approximate pacing schedule is in the table below.

Classes are lecture style, meeting Monday, Wednesday and Thursday in room Y219 from 11:30-1:20

Week	Dates	Monday	Wednesday	Thursday
1	Jan 11-14	R.5-R.6	R.7-R8,1.1	1.2, 1.4, 1.5
2	Jan 18-21	HW1, 2.1-2.3	2.4, 11.1-11.2	11.3-11.4
3	Jan 25-28	HW2, 3.1-3.2	3.3-3.4	3.5, 3.6
4	Feb 1-4	HW3, 4.1-4.2	4.3-4.4	Test 1 (HW 1-3)
5	Feb 8-11	Family Day	4.5, 5.1	5.2-5.3
6	Feb 15-18	HW4, 5.4-5.5	6.1-6.2	Reading Break
7	Feb 22-25	HW5, 6.3-6.4	6.5-6.6	6.7-6.8
8	Feb 29-Mar 3	HW6, 7.1-7.2	7.3	Test 2 (HW 4-6)
9	Mar 7-10	HW7, 7.4	7.5-7.6	7.7
10	Mar 14-17	HW8, 8.1-8.2	8.3-8.4	8.5
11	Mar 21-24	HW9, 8.7-8.8	13.1	13.2
12	Mar 28-31	Easter Monday	13.3 (includes binomials)	Test 3 (HW 7-9)
13	Apr 4-7	HW10, C1.1	C1.2	C1.3
14	Apr 11-14	HW11, C1.4	C1.5	Final Exam Review

Content: This course provides excellent preparation for MATH 100. Students away from algebra for more than a year should either refresh with MATH 073 before taking 115, or register for MATH 105 instead of 115. Topics: polynomial, rational, exponential, logarithmic, trigonometric and inverse trigonometric functions; sequences and series.

Resources: Math Labs (Ewing 224/342). These are drop in centers 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 – 10%
(b) In Class Tests – 40%
(c) Exams – Comprehensive Final exam: 50%

Homework is to be handed in by the end of class on Mondays (except the holidays of February 8 and March 12)

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

Dr. Montgomery's Teaching Philosophy

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