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

MATH-156-DX02
Math and Stats for Computing
Fall 2020

COURSE OUTLINE

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

Ω *Please note: This outline will <u>not</u> 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	Patricia (Pat) Wrean	
(b) Office hours	Mon 11:30 am – 1:20 pm, Wed 12:30 – 1:20, Thurs 11:30 – 12:20	
(c) Location	Online, accessed through D2L Collaborate tab or email link	
(d) Phone	250-370-4542	**Alternate**
(e) E-mail	wrean@camosun.bc.ca	
(f) Website	D2L and http://wrean.ca/math156/	

2. Intended Learning Outcomes

Upon completion of this course the student will be able to:
1. Show fluency with the numbering systems commonly used in computer science.
    a. Count using binary, octal, and hexadecimal bases.
    b. Convert decimal numbers to and from binary, octal, and hexadecimal bases.
    c. Convert numbers between binary, octal, and hexadecimal bases.

2. Use correct terminology, notation, and symbolic processes in logic and Boolean algebra to facilitate proper programming skills and logical thinking.
    a. Use truth tables to define the logical connectives "and", "or", and "not."
    b. Complete truth tables and use the laws of logic to simplify logical and Boolean expressions and prove equivalence.
    c. Use the conditional and related logical forms to translate English expressions into logical symbols and analyze conditional and bi-conditional propositions.

3. Use sequences and series to solve applied problems used in programming.
    a. Solve problems involving general and recursive forms for sequences, including the arithmetic and geometric cases.
    b. Evaluate sums for arithmetic and geometric series.

4. Use asymptotic (Big-O) notation to describe the response of various types of computer algorithms to changes in input size.
    a. Sketch graphs of linear, polynomial, exponential and logarithmic functions.
    b. Rank computer algorithms for efficiency based on their Big-O complexity.

5. Use probability theory to solve applied problems.
    a. Use counting techniques to solve applied problems.
    b. Calculate probabilities using simple events, counting techniques, and the properties of probability.
    c. Perform calculations involving the Normal distribution.

6. Organize, summarize, display, and interpret data in a meaningful way using descriptive statistical techniques.
   a. Describe a data set numerically by way of the mean, median, and standard deviation.
   b. Interpret histograms and other graphical displays of data sets.
   c. Make predictions about the distribution of a data set using the Empirical Rule and Tchebyshev's Theorem.

7. Use inferential statistical techniques to make predictions about populations.
   a. Discuss issues associated with collecting and interpreting data from sample surveys.
   b. For large samples, calculate and interpret confidence intervals for population means.
   c. Determine appropriate sample sizes.

8. Identify and articulate issues regarding the use and misuse of statistics in society, to gain an awareness of proper uses of statistics in the workplace.

3. Required Materials

(a) Texts - All course materials are online and available on the course websites.

(b) Any scientific calculator. You may not use a calculator with graphing capability. You may use a scientific calculator app like the one at Desmos: https://www.desmos.com/scientific .

4. Course Content and Schedule

Chapter 1: Binary, Octal, and Hexadecimal

1.1	Decimal and Octal
1.2	Binary and Hexadecimal
1.3	Converting Non-integer Numbers into Decimal
1.4	Converting from Decimal
1.5	Converting between Binary, Octal, and Hexadecimal

Chapter 2: Logic

2.1	Introduction to Logic
2.2	Venn Diagrams
2.3	Logical Equivalence
2.4	Boolean Algebra
2.5	Laws of Logic
2.6	More Laws of Logic
2.7	The Conditional
2.8	The Biconditional

Chapter 3: Sequences and Series

3.1	Introduction to Sequences and Series
3.2	Arithmetic Sequences and Series
3.3	Geometric Sequences and Series

Chapter 4: Big O Notation and Algorithmic Complexity

4.1	Big O and Rates of Growth
4.2	Factorial and Exponential Growth
4.3	Logarithmic Growth

Chapter 5: Describing Data with Graphs

5.1	Variables
5.2	Pie Charts and Bar Charts
5.3	Histograms

5. Basis of Student Assessment (Weighting)

Grade Calculation: The final grade will be calculated according to the following breakdown:

Assignments:	5%
Test 1:	20%
Test 2:	20%
Test 3:	20%
Test 4:	20%
Takehome Test 5:	15%

Tests: There will be five term tests. The first time a student misses a test for any reason, the weight of the missed test will be transferred to the remaining tests. No documentation is required for the first absence. Further absences will be treated on a case-by-case basis.

If at the end of the term, the student has written all five tests, then the test with the lowest score will be dropped when calculating the final grade.

Assignments: The assignments are online. The lowest assignment grade will be dropped when calculating the average of your assignments. This allows a student to miss one assignment for any reason, including illness, without penalty.

Late Submissions: The online assignments close on the due date and late online submissions will not be accepted.

Collaboration: Student are encouraged to collaborate (work together) on assignments and to consult the Math Lab tutor and/or the instructor when stuck. However, you must be prepared to answer similar questions on your own for the tests and final exam, so it is vital that you yourself understand all of the assigned questions and work that you turn in.

Academic Integrity: The Department of Mathematics and Statistics has prepared a handout called Student Guidelines for Academic Integrity to help you interpret college policies involving student conduct, academic dishonesty, plagiarism, etc. The course website has a link to the handout on the About page. It is your responsibility to become familiar with the contents of the document and the college policies it references.

6. Grading System

| X | Standard Grading System (GPA) |

| | Competency Based Grading System |

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

Help from the Math Lab in Tech 142 is available online via Microsoft Teams. Email Duncan at mcdougalld@camosun.bc.ca to request an invitation.

Students with disability-related academic barriers are encouraged to consult with the Centre for Accessible Learning (CAL) to see whether they are eligible for exam or in-class accommodations. The CAL website is http://camosun.ca/services/accessible-learning/ .

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	*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 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	*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.

9. Territorial Acknowledgement

Camosun College campuses are located on the traditional territories of the Lkwungen and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.