

	<p><b>School of Arts &amp; Science</b>  <b>MATHEMATICS DEPARTMENT</b></p> <p><b>MATH 254-X01</b>  <b>Probability and Statistics</b>  <b>2012 Q2</b></p>
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## COURSE OUTLINE

The Approved Course Description is available on the web @ <http://camosun.ca/learn/calendar/current/web/math.html#MATH254>

- Please note: this outline will be electronically stored for five (5) years only.  
It is strongly recommended students keep this outline for your records.

### 1. Instructor Information

(a)	Instructor:	Patricia Wrean (Pat)		
(b)	Office Hours:	Posted on office door and website		
(c)	Location:	CBA 153		
(d)	Phone:	(250) 370-4542	Alternative Phone:	
(e)	Email:	wrean@camosun.bc.ca		
(f)	Website:	<a href="http://wrean.disted.camosun.bc.ca/math254/">http://wrean.disted.camosun.bc.ca/math254/</a>		

### 2. Intended Learning Outcomes

*(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)*

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

1. Use techniques from combinatorics to solve counting problems. Calculate probabilities using simple events, counting techniques, and the axioms and properties of probability and conditional probability. Define and identify independent events, mutually exclusive events, and complements. Calculate probabilities using Bayes' theorem.
2. Describe a discrete data set graphically via a stem-and-leaf display, histogram, relative frequency polygon, and box plot.
3. Describe a discrete data set numerically by calculating the mean, mode, median, sample and population variance, and sample and population standard deviation. Make predictions about the distribution of a data set using the Empirical Rule and Tchebyshev's Theorem.
4. Perform calculations and solve problems involving probability distributions of discrete random variables, including binomial, Poisson, hypergeometric, and negative binomial distributions. Calculate the expected value of a random variable. Perform calculations involving probability distributions of continuous random variables, including normal and gamma distributions. Use the Standard Normal Table to solve problems involving normal distributions.
5. Describe and identify sampling plans. Calculate sampling distributions for sample mean and sample proportion. Interpret control charts for sample mean and proportion.
6. For large samples, calculate point estimates and confidence intervals for population means and proportions. Perform large-sample tests of hypothesis for population means and differences in means and for population proportions and differences in proportions.
7. For small samples, use the student's t distribution to calculate point estimates and confidence intervals and for hypothesis testing. For small samples, use the chi-square probability distribution to construct confidence intervals and perform hypothesis testing on the population variance.
8. For a bivariate data set, determine the regression (least squares) line, and calculate and interpret the coefficients of correlation and determination. Use least squares to fit quadratic, cubic, and exponential curves to a given bivariate data set.

### 3. Required Materials

- (a) There is no required text. An optional text is: Mendenhall, Beaver, Beaver, and Ahmed, "Introduction to Probability and Statistics", Second Canadian Edition, Nelson (2011).
- (b) Calculator: Only regular scientific calculators (non-programmable, non-graphing) will be permitted for quizzes and exams. The use of other electronic devices such as cell phones, MP3 players, iPods, electronic translators, etc., during exams is not allowed.

### 4. Course Content and Schedule

CHAPTER 1	Describing Data with Graphs
CHAPTER 2	Describing Data with Numerical Measures
CHAPTER 4	Probability and Probability Distributions
CHAPTER 5	Several Useful Discrete Distributions
CHAPTER 6	The Normal Probability Distribution
CHAPTER 7	Sampling Distributions
CHAPTER 8	Large-Sample Estimation
CHAPTER 9	Large-Sample Tests of Hypotheses
CHAPTER 10	Inference from Small Samples
CHAPTER 12	Linear Regression and Correlation

A more detailed breakdown by section will be available on the Recommended Problems sheet handed out in the first week of class.

### 5. Basis of Student Assessment (Weighting)

**Grade Calculation:** To get a C or higher in the course, you must pass the final exam (50% or higher) and have an overall average of 60% or higher, computed from:

Tests:	40%
Assignments:	10%
Final Exam:	50%

which is then converted to a letter grade using the standard Camosun grade scale. There is one exception: if your term work is at least 50% and you received 60% or higher in the final exam, then you will receive a C in the course even if your overall average is under 60%.

**Final Exam:** The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar, "students are expected to write tests and final examinations at the scheduled time and place." Exceptions will only be considered due to **emergency** circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.

**Tests:** There will be two term tests. If a student is absent for either of these two tests for any reason, the student will be given the opportunity to write a make-up test on the last day of classes.

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

**Late Policy:** Assignments that are late will be given a 25% penalty if the solutions have not yet been posted to the course website. Once the solutions have been posted, late assignments will not be accepted.

**Collaboration Policy:** Student are encouraged to collaborate (work together) on assignments. However, you must be prepared to answer similar questions on your own for the quizzes, so it is vital that you yourself understand all of the assigned questions and work that you turn in.

## 6. Grading System

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO 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](http://camosun.ca) 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, 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 3 <sup>rd</sup> course attempt or at the point of course completion.)
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.

## 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](http://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 on the College web site in the Policy Section.

**Math Room:** Technologies Centre (TEC) 142 (phone: 370-4492): 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).