



**School of Arts & Science
MATHEMATICS DEPARTMENT**

**MATH 264
Probability and Statistics
2008 Q3**

COURSE OUTLINE

The Approved Course Description is available on the web @ leungc.disted.camosun.bc.ca/

Ω 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:	Chi-Ming Leung		
(b)	Office Hours:	ThF10:30-11:20, MTuWTh14:30-15:20		
(c)	Location:	CBA 147		
(d)	Phone:	4448	Alternative Phone:	
(e)	Email:	leungc@camosun.bc.ca		
(f)	Website:	http://leungc.disted.camosun.bc.ca/		

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. Represent a data set using a stem-and-leaf display, histogram and relative frequency polygon.
2. Evaluate the mean, sample variance, population variance, sample standard deviation, population standard deviation, median and mode for a discrete data set.
3. Represent a data set using a boxplot.
4. Perform calculations using the axioms and properties of probability and conditional probability.
5. Perform calculations using the concepts of mutually exclusive events, independent events and complement of an event as well as the addition, multiplication and complement theorems.
6. Make predictions using Chebyshev's Theorem.
7. Perform calculations using Bayes' Theorem and its application.
8. Distinguish between discrete and continuous random variables.
9. Calculate probabilities using the probability distribution of a discrete random variable and the probability density function of a continuous random variable.
10. Calculate the cumulative distribution of a random variable and use it to calculate probabilities.
11. Calculate expected value of a random variable and expected value of a function of a random variable.
12. Calculate moments.
13. Perform calculations using the formula: variance = second moment – square of the first moment.

14. Evaluate the mean and variance of Bernoulli, Binomial, Poisson, Uniform, Normal, Exponential and Chi-Square random variables.
15. Evaluate the median of a continuous distribution.
16. Approximate a binomial distribution or a Poisson distribution by a normal distribution.
17. Create a joint probability distribution and use it to calculate probabilities.
18. Explain what a statistic is.
19. Describe the distribution of the sample mean.
20. Perform calculations and make predictions using the Central Limit Theorem.
21. Estimate a population parameter using the ideas of point estimation, unbiased estimators and estimators with minimum variance.
22. Describe and calculate a maximum likelihood estimator.
23. Calculate a confidence interval and use it make appropriate predictions regarding a population mean or proportion.
24. Use the t-distributions to evaluate the confidence intervals based on a normal population distribution.
25. Evaluate the confidence intervals for the variance of a normal population.
26. Describe what an hypothesis is and how it is used in statistics.
27. Describe type I error, type II error and p-value of a test; evaluate p-value of a test; and evaluate the type II errors for a given type I error of a test.
28. Design tests concerning population means and population proportions under different conditions such as small sample sizes, normal populations, known variances, unknown variances and their combinations.
29. Apply the simple linear regression model and know how to estimate the model parameters.
30. Construct a sample mean chart.
31. Construct an operating characteristic curve for a sampling plan.

3. Required Materials

(a)	Texts	Peter J. Trushel and Chi-Ming Leung, <i>Intermediate Statistics</i> , Camosun College Bookstore.
(b)	Other	

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

Outline

Hour s	Section n	Topic
3	5,6	Mean and Variance
2	1	Counting Techniques
3	2	Introduction to Probability
2	3	Introduction to Statistics
2	4	Pictures of Data
1	5	Measures of Central Tendency
1	6	Measures of Variation
2	7	Interpretations of Standard Deviation
1	8	Expected Value
2	9	Binomial Distribution
2	10	Poisson Distribution
3	11	Joint Probability Distributions
2	12	Sampling Distributions
2	13	The Normal Probability Distribution
2	14	Confidence Intervals for the Mean
1	15	Confidence Intervals for the Variance
2	16	Continuous Probability Density Functions
2	17	Linear Regression
2	18	Non-linear Regression
2	19	Large-Sample Hypothesis Tests About a Population Mean
2	20	Large-Sample Hypothesis Tests About a Population Proportion
2	21	Errors in Hypothesis Testing and the Power of a Test
1	22	Large-Sample Hypothesis Tests About Differences in Population Means
1	23	Large-Sample Hypothesis Tests About Differences in Population Proportions
2	24	Small-Sample Hypothesis Tests About a Population Mean

Lecture:	47 hours
3 Term Tests:	6 hours
Leeway:	1 hour
Holidays:	1 hour
Total:	55 hours

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

(a)	Assignments	
(b)	Quizzes	50%
(c)	Exams	50%
(d)	Other (eg, 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 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		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 at camosun.ca or 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 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	<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.

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.

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 on the College web site in the Policy Section.

[ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED](#)