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School of Arts & Science
MATHEMATICS DEPARTMENT

MATH 116 - 002
Elementary Statistics
2014 WINTER
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COURSE OUTLINE

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

This course is mainly for students in criminal justice, dental hygiene, social sciences and general arts. Topics include descriptive statistics, probability and probability models, one- and two-sample inferences for population means and proportions, simple linear correlation and regression, categorical data analyses.

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:	Jennifer Lindquist
(b)	Office:	E246
(c)	Phone:	250-370-3471
(d)	Email:	lindquistj@camosun.ca
(e)	Course Webpage:	http://online.camosun.ca/ (Desire2Learn)
(f)	Office Hours:	M 5:00-5:50, W 5:00-5:50 (non-lab days), or by appointment

2. Intended Learning Outcomes

The prerequisite is a C or higher in Principles of Math 11, or Applications of Math 11, or MATH 072, or MATH 135, or assessment. Upon completion of this course the student will be able to:

1. Identify problems in our society for which statistical analyses are suitable.
2. Compute and interpret descriptive statistics.
3. Solve basic probability problems. Distinguish between continuous and discrete probability distributions. Perform calculations involving various probability distributions including Binomial and Normal distributions.
4. Estimate the population mean and population proportion, and determine sample size.
5. Estimate the difference between two means, or two proportions.
6. Test hypotheses about a mean, a proportion, a difference of two means, or a difference of two proportions.
7. Perform basic correlation and simple linear regression analysis.
8. Perform basic categorical data analysis.
9. Perform basic statistical data analysis with the aid of a computer software package.

3. Required Materials

(a) Textbook: Bluman and Mayer, *Elementary Statistics*, Second Canadian Edition, McGraw-Hill Ryerson, 2011.

- *Student Solution Manual is available for free by registering at*

http://connect.mcgraw-hill.com/class/j_lindquist_math_116-002_winter_2014

(b) Calculator: Sharp EL-531 Scientific Calculator. *No other calculators are allowed for tests and the final examination.*

4.   Course Content and Other Course Information

Course Content
Note that some portions of chapter sections listed may be omitted.
Note that course content may be delivered in an order different than that listed.

Chapter 1: The Nature of Probability and Statistics
    Section 1.1 – Descriptive and Inferential Statistics
    Section 1.2 – Variables ad Types of Data
    Section 1.3 - Data Collection & Sampling Techniques
    Section 1.4 – Observational and Experimental Studies
    Section 1.5 – Uses and Misuses of Statistics
    Section 1.6 Computers and Calculators
Chapter 2: Frequency Distributions and Graphs
    Section 2.1 – Organizing Data
    Section 2.2 – Histograms, Frequency Polygons, and Ogives
    Section 2.3 – Other Types of Graphs
Chapter 3: Data Description
    Section 3.1 – Measures of Central Tendency
    Section 3.2 – Measures of Variation
    Section 3.3 – Measures of Position
    Section 3.4 – Exploratory Data Analysis
Chapter 4: Probability and Counting Rules
    Section 4.1 – Sample Spaces and Probability
    Section 4.2 – The Addition Rules for Probability
    Section 4.3 – The Multiplication Rules and Conditional Probability
Chapter 5: Discrete Probability Distributions
    Section 5.1 – Probability Distributions
    Section 5.2 – Mean, Variance, Standard Deviation, and Expectation
    Section 5.3 – The Binomial Distribution
Chapter 6: The Normal Distribution
    Section 6.1 – Normal Distribution
    Section 6.2 – Application of the Normal Distribution
    Section 6.3 – The Central Limit Theorem
Chapter 7: Confidence Intervals and Sample Size
    Section 7.1 – Confidence Intervals for the Mean When σ is Known
    Section 7.2 – Confidence Intervals for the Mean When σ is Unknown
    Section 7.3 – Confidence Intervals for Proportions
Chapter 8: Hypothesis Testing
    Section 8.1: Steps in Hypothesis Testing – Traditional Method
    Section 8.2 – *z* Test for a Mean
    Section 8.3 – *t* Test for a Mean
    Section 8.4 – *z* Test for a Proportion
Chapter 9: Testing the Difference Between Two Means, Two Proportions, and Two Variances
    Section 9.1 – Testing the Difference Between Two Means: Using the *z* Test
    Section 9.2 – Testing the Difference Between Two Means: Using the *t* Test
    Section 9.3 – Testing the Difference Between Two Means: Dependent Samples
    Section 9.4 – Testing the Difference Between Proportions
Chapter 10: Correlation and Regression
    Section 10.1 – Scatter Plots and Correlation
    Section 10.2 – Regression
Chapter 11: Other Chi-Square Tests
    Section 11.1: Test for Goodness of Fit
    Section 11.2: Tests Using Contingency Tables
Chapter 14: Sampling & Simulation
    Section 14.1 – Common Sampling Techniques

Excel Labs
Labs are held every second Wednesday before lecture, from 5:00-5:50 p.m., in room E115. Lab dates are:

> January 15 & 29
> February 12 & 26
> March 12 & 26

The computer lab sessions are designed to familiarize students with the use of a computer program to perform data analysis and the procedure of reporting data analysis results. Microsoft Excel will be used for this purpose. The lab instructions along with lab assignments can be found on Desire2Learn.

Homework
There are eight (8) homework assignments to be submitted for credit.

There are additional recommended problem sets, with solutions available, for every topic covered in lecture. These are not submitted for credit.

*In order to get a full understanding of the course materials, it is necessary to complete all homework problems. It is essential to do homework after every class and to keep up consistently. **Cramming does not work for this course.** It will be very helpful if you can schedule at least 30 minutes each day for completing the homework*, and spend 1 hour each week in the Math Lab (E224) to get all the help that you need for FREE. Ask questions before you get frustrated or behind. Please try to understand what you are doing when you work through each problem. Attempt each problem before you look at the solutions.

Tests and Practice Tests
There will be three tests, held in class on January 27, February 24, and March 31.

The class before each test there will be a practice test. You are encouraged to ask questions and to work together with peers during these practice test sessions. The practice tests and their solutions are posted on Desire2Learn. *You will benefit most from these practice tests if you have all notes reviewed, all homework problems completed and a summary sheet made before you attempt the problems.*

Attendance
Attendance is required. Showing up to classes is the easiest and most important thing you can do to help you succeed the course. **Keeping up is an essential part of any statistics course as much of the material builds on itself.** If you feel yourself falling behind at any point during the term, then please do not hesitate to come to speak to me.

Desire2Learn (D2L): http://online.camosun.ca
All course related materials - slides, lab materials, practice tests and solutions, grades, discussion forum and announcements will be available on D2L. It is your responsibility to check it regularly.

5. Basis of Student Assessment (Weighting)

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

> Assignments and Labs   20%

Tests (January 27, February 24, March 31)	40%	
Lab Final (take home, due April 9)	10%	
Final Exam	30%	

Late Assignments
NO late assignments will be accepted for credit.

Missed Tests
In the event that you missed a test or did poorly on a test due to family emergency or illness, the weight of the test will be put on the final exam *if* the instructor is notified *before* the event.

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. The calendar specifically states, "holidays or scheduled flights are not considered to be emergencies."

6. Grading System
Percentage grades will be converted to letter grades as follows:

A+	[90, 100]	B+	[77, 80)	C+	[65, 70)	F	[0, 50)
A	[85, 90)	B	[73, 77)	C	[60, 65)		
A-	[80, 85)	B-	[70, 73)	D	[50, 60)		

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

Textbook Website
You can access the Student Solutions Manual, an online version of the textbook, and several other resources here:

http://connect.mcgraw-hill.com/class/j_lindquist_math_116-002_winter_2014

Math Lab
You can get **free face-to-face tutoring** from our instructional assistant in the Math Lab **E224.** Lab hours are posted on the lab doors and on the Math Department page http://camosun.ca/learn/programs/math/. Find out what hours work for you best (when the lab is the least busy).

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 Academic Policies and Procedures at http://camosun.ca/learn/calendar/current/pdf/academic-policy.pdf.

Other Camosun Student Services
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.bc.ca.