



(see Course Descriptions for the applicable academic year: <http://www.ucalgary.ca/pubs/calendar/>)

Syllabus

<u>Topics</u>	<u>Number of hours</u>
EXPLORATORY DATA ANALYSIS Populations and sampling, simple random sample. Measures of location and spread: mean, median, mode, variance and standard deviation, quartiles. Grouped data, frequency histograms, shape, symmetry and skewness. The empirical rule. Graphical methods: Stem-and-leaf plots, Box-and-whisker plots.	5
REGRESSION AND CORRELATION Scatter diagrams, linear regression and correlation. Regression predictions - descriptive methods.	2
INTRODUCTION TO PROBABILITY Sample spaces and random events, Venn diagrams. Permutations and combinations. Definitions of probability. Basic probability laws.	4
CONDITIONAL PROBABILITY Conditional probability, probability trees, formula for total probability and Bayes' Theorem. Independence of random events.	3
RANDOM VARIABLES Random variables and their distributions. Joint probability distributions and independence.	3
DISCRETE DISTRIBUTIONS Uniform, binomial, hypergeometric, and Poisson distributions.	3
EXPECTATIONS AND VARIANCES Expectations, variances and covariances of random variables and their linear combinations. Application to discrete random variables.	6
CONTINUOUS RANDOM VARIABLES Concept of continuous random variable and its distribution. Uniform and Normal distributions and their properties. Central Limit Theorem. Approximation of the binomial by the Normal distribution. <u>Optional</u> : exponential distribution.	5
SAMPLING DISTRIBUTIONS Distribution of the sample mean from a Normal population. Central Limit Theorem and large sample mean distribution. Distribution of the sample proportion.	2
ESTIMATION AND HYPOTHESIS TESTING Introduction to confidence intervals and hypothesis testing using simple examples involving means and proportions.	3

TOTAL HOURS 36
