UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

Statistics 327 Environmental Statistics

Sampling environmental populations. Probability distributions. Estimating distribution parameters and quantiles. Hypothesis tests. Goodness of fit tests. Detecting trends. Outlier detection. Censored data.
Course Hours: H(3-1)
Prerequisite(s): Mathematics 249 or 251 or 281 or Applied Mathematics 217.

Syllabus

Topics	**Number of Hours**
Data collection, summarizing data, frequency distributions, relative frequency and probability, cumulative frequency and probability, means (averages), variances, standard deviations, (mean and standard deviation for grouped data)	**3**
Graphical displays of data (dot plot, stem and leaf diagram, ie Chart, bar graph, histogram) ranking data, quartiles, IQR, percentiles, box and whisker plot, introduction to probability	**3**
Probability, addition rule, Conditional probability, independence, Bayes' Rule, factorials, permutations and combinations	**3**
Bayes' Rule, Binomial and Poisson Distributions	**3**
Empirical Rule (normal curve), standardizing, normal approximation to Binomial, Central limit theorem	**2**
Determining required sample size for a population proportion, Confidence interval for a population mean (large and small samples), t-distribution, determining required sample size for a population mean	**3**
Scientific method, p-values, Type I and Type II error, selecting analyses and t-test, z-test for one population proportion z-test, t-test for one population mean, paired data F-test, Two independent samples pooled and non-pooled t-test	**5**
ANOVA, one-way multiple pooled t-tests, two-way ANOVA, ANOVA two-way replication. Tukey post hoc test for one-way ANOVA	**4**
Non-parametric tests for median, one-sample Wilcoxon, Paired Wilcoxon, Mann-Whitney, Kruskal Wallis, Freidman	**2**
Chi-square goodness-of-fit test, and independence test	**2**
Yates correction, Fisher exact test, standardizing proportions, Confidence interval for difference in two population proportions	**2**
Correlation and Regression	**2**
TOTAL	**34**

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