Fundamentals of Biostatistics
CVR 7300

Course Description

This is an introductory statistical course for marine
biology/oceanographic science majors. The course will introduce
elementary methods for presenting biological data in summary form,
analyzing biological data, and designing experiments. It is not a
mathematics course and so will not stress derivations of formulae but,
rather, will emphasize the application of statistical ideas and methods
to the design and interpretation of biological experiments and
comparative data. The student will be able to assess a situation
involving data analysis, state the nature of the biological question
and the null and alternative hypotheses proposed, decide on the correct
statistical procedure to test the null hypothesis and the assumptions
of the test used, calculate the statistic, assess its statistical
significance, and interpret the data in light of the calculated result.
Assessment of a student's performance will be done through the use of
assigned homework problems, quizzes, and a final exam. At the
completion of the course, students will be able to:

Calculate summary statistics

Calculate common probability distributions and apply those calculations
to solve problems based on biological studies

Randomly allocate experimental units to treatments and apply this
technique to solve problems based on biological studies

Calculate the distribution of observations about the mean based on the
assumption of normality and apply those calculations to solve problems
based on biological data

Calculate the distribution of sample means about the mean and apply
those calculations to solve problems based on biological data

Design simple biological experiments

Compare two means (from paired and unpaired data) using both parametric
and non-parametric methods and use those methods to test hypotheses

Analyze categorical data to test both goodness-of-fit and contingency
hypotheses

Compare more than two means using analysis of variance methods and use
those methods to test hypotheses derived from both single-factor and
two-factor experimental designs

Calculate least-squares regression lines and apply those calculations
to solve problems based on biological studies.