

# STATISTICS (STAT)

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## Courses

### STAT 509. General Statistics. 4 Units.

Introduces statistical methods of summarizing, analyzing, presenting, and interpreting data, with emphasis on health-related data. Includes: normal and binomial distributions; probability; central limit theorem; confidence intervals; and, hypothesis testing using t-tests, ANOVA, correlation, linear regression, and chi square. Introduces multivariate analysis. Includes extensive laboratory exercises using SPSS.

### STAT 515. Grant- and Contract-Proposal Writing. 3 Units.

Overview of research and program-based grantsmanship. Provides a comprehensive review of relevant core structures, stakeholders, processes, factors, and essential skills. Demonstrates in a "real world"-type practice environment, key steps in identification of funding resources, proposal development, submission, and review process. Includes: developing specific aims or objectives, determining appropriate research or program design, evaluation, budgets, and sustainability plans.

### STAT 521. Biostatistics I. 4 Units.

Fundamental concepts in data analysis and statistical inference. Descriptive statistics, probability rules, discrete/continuous probability distributions, sampling distributions, central limit theorem, point/interval estimation for means/proportions, hypothesis testing, one-/two-sample tests, power analysis, ANOVA and multiple comparison procedures, simple regression/correlation, and chi-square tests. Prerequisite or concurrent: STAT 548 or STAT 549; or consent of instructor.

### STAT 522. Biostatistics II. 4 Units.

Simple and multiple regression, analysis of the residual, and model building. Multiple and partial correlation. Analysis of variance (fixed-effects model S) with multiple comparisons, including orthogonal contrasts, factorial designs, and analysis of covariance. Power analysis and sample size determination for these models. Prerequisite: STAT 521.

### STAT 523. Biostatistics III. 3 Units.

Acquaints public health graduate students with methods for analyzing correlated data using a regression point of view. Includes longitudinal data analysis and cluster/nested data. Covers the use of random effects models and generalized estimation equations (GEE) and more. Emphasis is on how the data should be analyzed rather than on theory. Prerequisite: STAT 522.

### STAT 545. Survival Analysis. 3 Units.

Statistical methods for analysis of survival data. Censoring mechanisms. Concepts of failure rates and different classes of life distributions under parametric and nonparametric settings. Statistical properties of competing survival functions estimators. Kaplan-Meier estimator, piecewise exponential estimator, and other equivalent estimators. Cox proportional hazard model and associated statistical inferences. Prerequisite: STAT 522.

### STAT 548. Analytical Applications of SAS and R. 2 Units.

Introduces learning the SAS and R statistical programming languages. Includes basic data manipulation, graphics, and introductory statistical analysis. Also emphasizes decision making regarding choice of statistical procedures and interpretation of computer output. Prerequisite or concurrent: STAT 509 or STAT 521; or passing score on the computer-competency examination.

### STAT 549. Analytical Applications of SPSS. 2 Units.

Features of SPSS computer package for analysis of statistical data. Includes decisions regarding choice of statistical procedures and interpretation of computer output to answer specific research questions. Prerequisite or concurrent: STAT 509 or STAT 521.

### STAT 557. Research Data Management. 3 Units.

Addresses basic data and file manipulation using database-management systems for health research. Includes: importing, exporting, merging, and linking files for a variety of applications; creating, updating, and querying databases; and, basic programming, application development, and data entry. Prerequisite: STAT 509 or STAT 521; STAT 548 or STAT 549.

### STAT 568. Data Analysis. 3 Units.

Concepts and applications of the most common data analysis methods: correlation and regression, t-tests, analysis-of-variance, nonparametric methods, and multivariate analyses. Student selects appropriate method of analysis and reporting results. Emphasizes individual analysis of real-data sets. All data analysis assignments to be completed in SPSS. Prerequisite: STAT 514.

### STAT 569. Advanced Data Analysis. 3 Units.

Brings together other biostatistics courses in a unified, applied approach. Specifically provides practical experience with real-world biostatistical data, using a wide variety of statistical procedures—including general linear models, generalized linear models, and nonparametric alternatives. Includes guidelines for choosing statistical procedures, model building, validation, and written presentation of results. Prerequisite: STAT 522.

### STAT 594. Statistical Consulting. 1-4 Units.

Advanced students participate in statistical consultation with senior staff members. Statement of the problem, design of the experiment, definition of response variables, appropriate analysis of data, statistical inferences, and interpretation of data. Prerequisite: EPDM 509, STAT 521; or consent of instructor.