**Biostatistics (BST)**

**Graduate Studies**

**BST 222 — Biostatistics: Survival Analysis (4 units)**
*Course Description:* Incomplete data; life tables; nonparametric methods; parametric methods; accelerated failure time models; proportional hazards models; partial likelihood; advanced topics.
*Prerequisite(s):* STA 131C.
*Learning Activities:* Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).
*Cross Listing:* STA 226.
*Grade Mode:* Letter.

**BST 223 — Biostatistics: Generalized Linear Models (4 units)**
*Course Description:* Likelihood and linear regression; generalized linear model; Binomial regression; case-control studies; dose-response and bioassay; Poisson regression; Gamma regression; quasi-likelihood models; estimating equations; multivariate GLMs.
*Prerequisite(s):* STA 131C.
*Learning Activities:* Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).
*Cross Listing:* STA 223.
*Grade Mode:* Letter.

**BST 224 — Analysis of Longitudinal Data (4 units)**
*Course Description:* Standard and advanced methodology, theory, algorithms, and applications relevant for analysis of repeated measurements and longitudinal data in biostatistical and statistical settings.
*Prerequisite(s):* (BST 222 or STA 222); (BST 223 or STA 223); STA 232B; or consent of instructor.
*Learning Activities:* Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).
*Cross Listing:* STA 224.
*Grade Mode:* Letter.

**BST 225 — Clinical Trials (4 units)**
*Course Description:* Basic statistical principles of clinical designs, including bias, randomization, blocking, and masking. Practical applications of widely-used designs, including dose-finding, comparative and cluster randomization designs. Advanced statistical procedures for analysis of data collected in clinical trials.
*Prerequisite(s):* BST 223 or STA 223; or consent of instructor.
*Learning Activities:* Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).
*Cross Listing:* STA 225.
*Grade Mode:* Letter.

**BST 226 — Statistical Methods for Bioinformatics (4 units)**
*Course Description:* Standard and advanced statistical methodology, theory, algorithms, and applications relevant to the analysis of -omics data.
*Prerequisite(s):* BST 131C or consent of instructor; data analysis experience recommended.
*Learning Activities:* Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).
*Cross Listing:* STA 226.
*Grade Mode:* Letter.

**BST 227 — Machine Learning in Genomics (4 units)**
*Course Description:* Emerging problems in molecular biology and current machine learning-based solutions to those problem. How deep learning, kernel methods, graphical models, feature selection, non-parametric models and other techniques can be applied to application areas such as gene editing, gene network inference and analysis, chromatin state inference, cancer genomics and single cell genomics.
*Prerequisite(s):* STA 208 or ECS 171; or consent of instructor.
*Learning Activities:* Lecture/Discussion 3 hour(s), Project.
*Grade Mode:* Letter.

**BST 252 — Advanced Topics in Biostatistics (4 units)**
*Course Description:* Biostatistical methods and models selected from the following: genetics, bioinformatics and genomics; longitudinal or functional data; clinical trials and experimental design; analysis of environmental data; dose-response, nutrition and toxicology; survival analysis; observational studies and epidemiology; computer-intensive or Bayesian methods in biostatistics.
*Prerequisite(s):* BST 222; BST 223.
*Learning Activities:* Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).
*Repeat Credit:* May be repeated when topic differs with consent of advisor.
*Cross Listing:* STA 252.
*Grade Mode:* Letter.

**BST 290 — Seminar in Biostatistics (1 unit)**
*Course Description:* Seminar on advanced topics in the field of biostatistics. Presented by members of the Biostatistics Graduate Group and other guest speakers.
*Learning Activities:* Seminar 1 hour(s).
*Enrollment Restriction(s):* Restricted to graduate standing.
*Repeat Credit:* May be repeated 12 time(s).
*Grade Mode:* Satisfactory/Unsatisfactory only.

**BST 298 — Directed Group Study (1-5 units)**
*Course Description:* Special topics in Biostatistics appropriate for group study at the graduate level.
*Learning Activities:* Variable 3-15 hour(s).
*Repeat Credit:* May be repeated.
*Grade Mode:* Letter.

**BST 299 — Special Study for Biostat Graduate Students (1-12 units)**
*Course Description:* Special topics in Biostatistics appropriate for directed individual study on advanced topics not otherwise covered in the Biostatistics curriculum.
*Learning Activities:* Variable 3-36 hour(s).
*Repeat Credit:* May be repeated.
*Grade Mode:* Satisfactory/Unsatisfactory only.

**BST 299D — Dissertation Research (1-12 units)**
*Course Description:* Research in Biostatistics under the supervision of major professor.
*Prerequisite(s):* Consent of instructor; advancement to Candidacy for Ph.D.
*Learning Activities:* Variable 3-36 hour(s).
*Repeat Credit:* May be repeated.
*Grade Mode:* Satisfactory/Unsatisfactory only.