BIOSTATISTICS (BIOS)

Courses

BIOS 200. Med Biostatistics & Epidemiology. 3 Credits.
Introductory design and analysis of medical studies. Epidemiological concepts, case-control and cohort studies. Clinical trials. Students evaluate statistical aspects of published health science studies. Prerequisites: STAT 111, STAT 141 or STAT 143; or STAT 211. Cross-listed with: STAT 200.

BIOS 211. Statistical Methods I. 3 Credits.
Fundamental concepts for data analysis and experimental design. Descriptive and inferential statistics, including classical and nonparametric methods, regression, correlation, and analysis of variance. Statistical software. Prerequisite: Junior standing. Cross-listed with: STAT 211.

BIOS 221. Statistical Methods II. 3 Credits.

BIOS 223. Applied Multivariate Analysis. 3 Credits.
Multivariate normal distribution. Inference for mean vectors and covariance matrices. Multivariate analysis of variance (MANOVA), discrimination and classification, principal components, factor analysis. Prerequisite: Any 200 level Statistics course; STAT 221 or STAT 225 recommended; matrix algebra recommended. Cross-listed with: STAT 223.

BIOS 229. Survival Analysis. 3 Credits.
Probabilistic models and inference for time-to-event data. Censored data, life tables, Kaplan-Meier estimation, logrank tests, proportional hazards regression. Specialized applications (e.g. clinical trials, reliability). Prerequisite: Any 200 level Statistics course; one year of calculus. Cross-listed with: STAT 229.

BIOS 231. Experimental Design. 3 Credits.
Randomization, complete and incomplete blocks, cross-overs, Latin squares, covariance analysis, factorial experiments, confounding, fractional factorials, nesting, split plots, repeated measures, mixed models, response surface optimization. Prerequisites: BIOS 211 (BIOS 221 recommended). Cross-listed with: STAT 231.

BIOS 235. Categorical Data Analysis. 3 Credits.
Measures of association and inference for categorical and ordinal data in multiway contingency tables. Log linear and logistic regression models. Prerequisite: BIOS 211. Cross-listed with: STAT 235.

BIOS 241. Statistical Inference. 3 Credits.
Introduction to statistical theory; related probability fundamentals, derivation of statistical principles, and methodology for parameter estimation and hypothesis testing. Pre/co-requisites: BIOS 151, BIOS 153 or BIOS 25; BIOS 141 or equivalent; MATH 121. Cross-listed with: STAT 241.

BIOS 251. Probability Theory. 3 Credits.

BIOS 261. Statistical Theory. 3 Credits.
Point and interval estimation, hypothesis testing, and decision theory. Application of general statistical principles to areas such as nonparametric tests, sequential analysis, and linear models. Pre/co-requisites: STAT 251 or either STAT 151 or STAT 153 with Instructor permission. Cross-listed with: STAT 261.

BIOS 308. Applied Biostatistics. 3 Credits.
The rationale and application of biostatistical methods in the biological, health and life sciences with emphasis on interpreting and reporting. Prerequisite: STAT 141 or equivalent. Cross-listed with: MPBP 308, STAT 308.

BIOS 350. Advanced Methods in Biostat. 3 Credits.
Essential topics in modern biostatistics including epidemiology studies, clinical trials, statistical genetics, issues involved in secondary data analysis of complex surveys. Prerequisites: STAT 261 & STAT 200 or Instructor permission. Cross-listed with: STAT 350.

BIOS 391. Master’s Thesis Research. 1-12 Credits.
Credit as arranged.

BIOS 395. Advanced Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.