

STATISTICS (STAT)

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COURSES

330 Introductory Statistics 3

Frequency tables, histograms, probability, well-known probability distributions, one and two sample tests of hypotheses, confidence intervals, and contingency tables. Prereq: MATH 103, 104, or 107. (ND: MATH)

331 Regression Analysis 2

Simple and multiple regression techniques and correlation coefficients. Emphasis on applications. Prereq: STAT 330.

367 Probability 3

Probability, probability distributions for discrete random variables, probability density functions, marginal joint probability density functions, expected value and variance, and transformations. Prereq: MATH 166.

368 Statistics 3

Moments, moment generating functions, central limit theorem, one and two sample tests of hypotheses, estimation, and simple linear regression and correlation. Prereq: STAT 367.

450/650 Stochastic Processes 3

Discrete time Markov chains, Poisson processes, continuous time Markov chains, birth and death processes, renewal processes, branching processes, queuing systems, and applications. Prereq: STAT 368.

451/651 Bayesian Statistical Decision Theory 3

Bayesian approach to statistics including utility and loss, prior and posterior densities, and Bayesian inference. Comparisons with classical statistical methods. Prereq: STAT 368 or 468.

460/660 Applied Survey Sampling 3

Simple random, stratified, systematic and cluster sampling; two-stage sampling. Estimation of population means and variances. Ratio and regression estimators. Prereq: STAT 330 or 368.

461/661 Applied Regression Models 3

Simple linear regression, matrix approach to multiple regression, and introduction to various tests and confidence intervals. Includes discussion of multicollinearity and transformations. Prereq: STAT 330 or 368, knowledge of matrix algebra.

462/662 Introduction to Experimental Design 3

Fundamental principles of designing an experiment, randomized block, Latin square, and factorial. Also covers analysis of covariance and response surface methodology. Prereq: STAT 330 or 368.

463/663 Nonparametric Statistics 3

Various tests and confidence intervals that may be used when the underlying probability distributions are unknown. Includes the Wilcoxon, Kruskal-Wallis, and Friedman. Prereq: STAT 330 or 368.

464/664 Discrete Data Analysis 3

Application of binomial, hypergeometric, Poisson, mixed Poisson, and multinomial distributions in discrete data analysis. Log-linear models and contingency tables. Logistic regression. Discrete discriminant analysis. Prereq: STAT 368.

465/665 Meta-Analysis Methods 3

Statistical methods for meta-analysis with applications. Various parametric effect size from a series of experiments: fixed effect, random effect linear models; combining estimates of correlation coefficients; metaanalysis in the physical and biological sciences. Prereq: STAT 331, 461/661, or 725.

467 Probability and Mathematical Statistics I 3

Random variables, discrete probability distributions, density functions, joint and marginal density functions, transformations, limiting distributions, central limit theorem. Prereq: MATH 265 or STAT 368.

468 Probability and Mathematical Statistics II 3

Properties of estimators, confidence intervals, hypotheses testing, Neyman-Pearson lemma, likelihood ratio tests, complete and sufficient statistics. Prereq: STAT 467.

470/670 Statistical SAS Programming 3

Focuses on statistical problem solving and writing SAS computer code. Data types, data management, data input/output, SAS as a programming language, data analysis, report writing, and graphing. Prereq: STAT 461/661, 462/662, or 726.

472/672 (750) Time Series 3

Estimation of trend in time series data. Seasonal models. Stationary models. Moving average, autoregressive, and ARMA models. Model identification. Forecasting. Intervention analysis. Prereq: STAT 468 or 768, 461/661, course in matrix algebra.

476 Actuary Exam Study II 1

Selected material from probability and mathematical statistics in preparation for the national actuarial exam. Prereq: STAT 368 or 468.

520 Statistical Methods for Pharmacy 3

Descriptive statistics, life tables, probability, binomial and normal distributions, estimation, hypothesis testing, introduction to regression and ANOVA. Examples from the medical/pharmaceutical area. Prereq: MATH 103 or 107.

725 Applied Statistics 3

Data description, probability, inference on means, proportions, difference of means and proportions, categorical data, regression, analysis of variance, and multiple comparisons.

Prereq: Knowledge of algebra. This course is not intended for statistics or mathematics majors.

726 Applied Regression and Analysis of Variance 3

Simple and multiple regression, ANOVA tables, correlation, regression diagnostics, selection procedures, analysis of covariance, one-way ANOVA, two-way ANOVA. Prereq: STAT 725.

730 Biostatistics 3

Direct assays, parallel line assays, slope ratio assays, multiple assays, and quantal assays. Model, estimation, and testing. Probit and logit analysis.

Prereq: STAT 461/661 or 725.

732 Introduction to Bioinformatics 3

See Mathematics for description.

761 Advanced Regression 3

Multiple regression, analysis of residuals, model building, regression diagnostics, multicollinearity, robust regression, and nonlinear regression.

Prereq: STAT 468 or 768, 461/661, course in matrix algebra.

762 Messy Data Analysis 3

One-way classification models with heterogeneous errors. Two-way classification analysis in the unbalanced case. Analysis of mixed models. Split-plot, nested, and crossover designs.

Prereq: STAT 462/662.

764 Multivariate Methods 3

Sample geometry; correlation; multiple, partial, canonical correlation test of hypothesis on means; multivariate analysis of variance; principal components; factor analysis; and discriminant analysis.

Prereq: STAT 461/661 or 462/662, course in matrix algebra.

767 Probability and Mathematical Statistics I 3

Random variables, discrete probability distributions, density functions, joint and marginal density functions, transformations, limiting distributions, central limit theorem. Additional project required.

Prereq: MATH 265 or STAT 368.

768 Probability and Mathematical Statistics II 3

Properties of estimators, confidence intervals, hypotheses testing, Neyman-Pearson lemma, likelihood ratio tests, complete and sufficient statistics. Additional projects required.

Prereq: STAT 767.

770 Survival Analysis 3

Basic methodology in the analysis of Censored Data, two basic types of censoring, parametric estimation, nonparametric estimation, and life table methods.

Prereq: STAT 768.

774 Linear Models I 3

General linear models. Full rank models. Estimation, confidence ellipsoids, and tests of hypotheses. Not full rank models. Applications to regression and design of experiments.

Prereq: STAT 768, course in matrix algebra.

775 Linear Models II 3

Repeated measurements models. Variance components models. Response surfaces. Growth curve models, unbalanced designs.

Prereq: STAT 774.

777 Multivariate Theory 3

Wishart distribution, distribution of Hotelling's T-square and Lambda statistics, cluster analysis, correspondence analysis, principal components, factor analysis, discriminant analysis, multidimensional scaling.

Prereq: STAT 764.

778 Modern Probability Theory 3

Probability theory presented from the measure theoretic perspective. Emphasis on various types of convergence and limit theorems. Discussion of random walks, conditional expectations, and martingales.

Prereq: STAT 767, MATH 750. Cross-listed with MATH.

780 Asymptotics, Bootstrap, and Other Resampling Plans 3

Development of large sample and small sample properties of a variety of estimators.

Prereq: STAT 768.

786 Advanced Inference 3

Further discussion of properties of estimators, theory of estimation, and hypotheses testing.

Prereq: STAT 768.