

Statistics (STAT)

Giovanni Petris
Director of Statistics Program
314 Science-Engineering Building

Requirements for a Minor in Statistics:

Coursework used toward the mathematics major may not be applied toward a statistics minor.

MATH 24004	Calculus I (ACTS Equivalency = MATH 2405)	4
12 hours of STAT courses, including 9 hours in courses numbered 3000 and above.		12
Total Hours		16

Courses

STAT 28233. Biostatistics. 3 Hours.

An introductory course in biostatistics emphasizing methods for collecting, graphing, and understanding data. Special emphasis is placed upon available methods for both exploratory and confirmatory data analysis. Particular attention is given to statistical methods for data sets with discrete variables. Pre- or Corequisite: MATH 24004. Corequisite: Lab component. (Typically offered: Spring)

STAT 30041. Statistics Methods Laboratory. 1 Hour.

Introduction to the statistical software SAS, including its use for common statistical analyses. A practical complement to the statistical methodology covered in STAT 30043. (Typically offered: Fall and Spring)

STAT 30043. Statistical Methods. 3 Hours.

Describing Data, Basic Probability, Random variables, Uniform, Normal and Binomial Distributions, Sampling Distributions, Confidence Intervals, Hypothesis testing, Correlation and Regression, Contingency table, Comparing two populations, ANOVA. Prerequisite: MATH 24004. (Typically offered: Fall and Spring)

STAT 30133. Introduction to Probability. 3 Hours.

A calculus-based introduction to probability. Discrete probability spaces and counting techniques, discrete and continuous probability distributions, random variables, random samples, law of large numbers, central limit theorem. Prerequisite: MATH 25004. (Typically offered: Fall, Spring and Summer)
This course is cross-listed with MATH 30103.

STAT 31133. Introduction to Mathematical Statistics. 3 Hours.

A calculus-based introduction to mathematical statistics, revolving around estimation, hypothesis testing, and Bayesian inference. Emphasis is given to the unifying mathematical and decision-theoretical principles that provide a justification to different estimation and testing procedures. Prerequisite: STAT 30133 or departmental consent. (Typically offered: Spring)

STAT 40133. Statistical Forecasting and Prediction. 3 Hours.

Provides an in depth look at the theory and practice of applied modeling of temporal data for data science, including model building, selection, autocorrelation, autoregression and moving averages, and prediction for correlated data. Students will gain experience using statistical software to learn from data using applied time series and models. Prerequisite: STAT 30043 or department consent. (Typically offered: Fall)

STAT 40233. Bayesian Methods. 3 Hours.

Provides an introductory look at the theory and practice of applied Bayesian modeling for data science: including model building, selection, regularization, classification and prediction. Students will gain experience using statistical software to learn from data using applied Bayesian models. Prerequisite: STAT 30043 or department consent. (Typically offered: Spring)

STAT 40333. Nonparametric Statistical Methods. 3 Hours.

Goodness-of-fit tests, nonparametric inference in one-sample and two-sample location model, one-way and two-way ANOVA, nonparametric measures of association, Empirical distribution function, Bootstrap and Jackknife, Kernel density estimation. Prerequisite: STAT 28233 or STAT 30043 or departmental consent. (Typically offered: Fall)

STAT 40433. Sampling Techniques. 3 Hours.

Considers optimum techniques of simple random, stratified random, cluster, systematic and multistage sampling from finite populations subject to cost precision constraints. Wide range of applications. Prerequisite: STAT 30043 or department consent. (Typically offered: Fall, Spring and Summer)

STAT 4053V. Internship in Professional Practice. 1-3 Hour.

Professional work experience involving significant use of mathematics or statistics in business, industry or government. Prerequisite: Departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

STAT 41031. Introduction to R. 1 Hour.

A hands-on introduction to R software, a free and open-source computing environment used for data manipulation and analysis across a broad spectrum of subject areas. Intended for new users. Content begins with simple data manipulation, then complex data structures and common statistical procedures are covered. (Typically offered: Fall)

STAT 43333. Analysis of Categorical Responses. 3 Hours.

Statistical tools to analyze univariate and multivariate categorical responses. Emphasis is given to Generalized Linear Models, including logistic regression and loglinear models. Prerequisite: STAT 30043 or departmental consent. (Typically offered: Spring)

STAT 43733. Experimental Design. 3 Hours.

Topics in the design and analysis of planned experiments, including randomized block, Latin square, split plot, and BIB designs, use of fractional factorial replication, and repeated measures. Prerequisite: STAT 30043 or department consent. (Typically offered: Spring)