STATISTICS & OPERATIONS RESEARCH (STAT-UB)

STAT-UB 1 Stats F/Business Control (4 Credits)
Typically offered occasionally
This course examines modern statistical methods as a basis for decision making in the face of uncertainty. Topics include probability theory, discrete and continuous distributions, hypothesis testing, estimation, and statistical quality control. With the aid of computers, these statistical methods are used to analyze data.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 3 Regress/Forcasting Model (1.5 Credits)
Typically offered Fall, Spring, and Summer terms
Presents an introduction to statistical models and their application to decision making. Topics include the simple linear regression model, inference in regression analysis, sensitivity analysis, and multiple regression analysis.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No
Prerequisites: STAT-UB 1 or ECON-UA 18 OR 20 OR MATH-UA 234 OR POL-UA 800 OR SOC-UA 302 OR MA-UY 2224 OR MATH-SHU 235 OR 238 OR MATH-UH 2011Q OR REBS1-UC 1101 OR Statistics Proficiency =>100.

STAT-UB 8 Appl Stoch Proc F/Fin Models (3 Credits)
Typically offered occasionally
Presents a mathematical background for the stochastic processes that are widely employed as modeling tools in finance. The emphasis is on an intuitive approach and examples rather than on proofs and mathematical rigor. Topics include random walks, martingales, Markov chains, Poisson process and other continuous time Markov chains, Brownian motion, geometric Brownian motion, and other diffusion processes. The relevance of the considered processes to financial modeling is stressed throughout. In particular, applications to pricing of derivative securities and to modeling of the term structure of interest rates are discussed.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 14 Intro Theory of Probability (3 Credits)
Typically offered occasionally
Covers the basic concepts of probability. Topics include the axiomatic definition of probability; combinatorial theorems; conditional probability and independent events; random variables and probability distributions; expectation of functions of random variables; special discrete and continuous distributions, including the chi-square, t, F, and bivariate normal distributions; law of large numbers; central limit theorem; and moment generating functions. The theory of statistical estimation is introduced with a discussion on maximum likelihood estimation.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No
Prerequisites: MATH-UA 122 OR MATH-UA 123 OR MATH-UA 221 OR MATH-UH 1020Q OR MATH-SHU 131 OR MATH-UA 132 OR AP CALCULUS 4.00 OR MATH 7.

STAT-UB 15 Stat Infer/Regress.Analy (3 Credits)
Typically offered occasionally
Consists of two distinct components: statistical inference and regression analysis. Statistical inference topics include the principles of statistical estimation and inference, Neyman Pearson Lemma, testing of means, variances, tests of independence, and nonparametric methods. Regression analysis discusses the general linear regression model, least squares estimation, departures from standard assumptions, autocorrelation, multicollinearity, analysis of residuals, choice of variables, and nonlinear models.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 17 Regression & Multivariate Data Analysis (3 Credits)
Typically offered occasionally
This is a data-driven, applied statistics course focusing on the analysis of data using regression models. It emphasizes applications to the analysis of business and other data and makes extensive use of computer statistical packages. Topics include simple and multiple linear regression, residual analysis and other regression diagnostics, multicollinearity and model selection, autoregression, heteroscedasticity, regression models using categorical predictors, and logistic regression. All topics are illustrated on real data sets obtained from financial markets, market research studies, and other scientific inquiries.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 18 Forecast Time Series Dat (3 Credits)
Typically offered occasionally
A model-based approach to forecasting time series data, with emphasis on model building, foundations, and applications. Students will use the methodology of the course to analyze data sets of their choice in two projects. Weekly homework assignments on data analysis and theory. Topics of the course include the following: Autocorrelation vs. trend; Mean Squared Error for measuring forecast performance; Conditional distribution of future given present and past; Mean reversion (stationarity) and differencing; ARIMA models, their properties, and the corresponding forecasts; Box-Jenkins approach to statistical modeling: estimation, identification, diagnostic checking; Model Selection using informaiton criteria; Exponential Smoothing; Linear vs. Nonlinear models; Chaos; Best possible forecast vs. best linear forecast; ARCH/GARCH models for forecasting volatility; Fractional ARIMA and long-memory models; Seasonal ARIMA models; Unit root tests and cointegration.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 21 Introduction to Stochastic Processes (3 Credits)
Typically offered occasionally
This is an introductory course in stochastic processes. Presents classes of stochastic processes, which are widely used as modeling tools in many fields of application, including finance, economics, accounting, and actuarial science. Covers basic theory of discrete and continuous time Markov chains, Brownian motion and its generalization, and martingales. Also discusses statistical aspects of these processes. In the final part of the course, introduces the idea of stochastic integration and develops the rules of stochastic calculus. If time permits, also considers some stochastic differential equations.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 27 Mathematics of Investmnt (3 Credits)
Typically offered occasionally
Discusses the mathematical and technical aspects of investments. Topics include measurement of interest and discount rates, accumulated value and present value, annuities, sinking funds, amortization of debt, and determination of yield rates on securities. Applications include bond evaluation, mortgages, capital budgeting, and depreciation methods.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 94 Ind Study: Stats, Op Res or Actuarial Science (1 Credit)
Typically offered occasionally
Independent study provides an opportunity for a select group of upperclassmen each year to work one-on-one with a faculty member on a topic selected by the student and approved by the supervising faculty member. Each student is expected to spend as much time on the independent study as would be spent on a regular course, and the topic selected may not replicate an existing course. An information sheet with important guidelines about Independent Study is available at stern.nyu.edu/portal-partners/current-students/undergraduate/resources-policies/forms.
Grading: Ugrd Stern Graded
Repeatable for additional credit: Yes

STAT-UB 103 Stats F/Bus Cntl Regress & Forecasting Models (4 Credits)
Typically offered Fall, Spring, and Summer terms
This course examines modern statistical methods as a basis for decision making in the face of uncertainty. Topics include probability theory, discrete and continuous distributions, hypothesis testing, estimation, and statistical quality control. With the aid of computers, these statistical methods are used to analyze data. Also presented are an introduction to statistical models and their application to decision making. Topics include the simple linear regression model, inference in regression analysis, sensitivity analysis, and multiple regression analysis.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 9001 Stats F/Business Control (4 Credits)
This course examines modern statistical methods as a basis for decision making in the face of uncertainty. Topics include probability theory, discrete and continuous distributions, hypothesis testing, estimation, and statistical quality control. With the aid of computers, these statistical methods are used to analyze data.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No

STAT-UB 9003 Regress/Forecasting Model (1.5 Credits)
Typically offered Spring
Presents an introduction to statistical models and their application to decision making. Topics include the simple linear regression model, inference in regression analysis, sensitivity analysis, and multiple regression analysis.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No
Prerequisites: STAT-UB 1 or ECON-UA 18 OR 20 OR MATH-UA 234 OR POL-UA 800 OR SOC-UA 302 OR MA-UY 2224 OR MATH-SHU 235 OR 238 OR MATH-UH 2011Q OR REBS1-UC 1101 OR Statistics Proficiency =>100.

STAT-UB 9103 Stats F/Bus Cntl Regress & Forecasting Models (4 Credits)
Typically offered Fall and Spring
This course examines modern statistical methods as a basis for decision making in the face of uncertainty. Topics include probability theory, discrete and continuous distributions, hypothesis testing, estimation, and statistical quality control. With the aid of computers, these statistical methods are used to analyze data. Also presented are an introduction to statistical models and their application to decision making. Topics include the simple linear regression model, inference in regression analysis, sensitivity analysis, and multiple regression analysis.
Grading: Ugrd Stern Graded
Repeatable for additional credit: No