Statistics course work acquaints students with the role played in the modern world by probabilistic and statistical ideas and methods. Students grow familiar with both the theory and the application of techniques in common use as they are trained in statistical research.

The flexibility of the undergraduate program allows students to concentrate on theoretical or applied training, or they may link their studies in statistics to work in other related departments.

The graduate program has concentrations in applied probability, Bayesian methodology, bioinformatics, biomathematics, biostatistics, computational finance, epidemiology, large and complex data, machine and statistical learning, quality control, statistical computing, spatial and, stochastic processes, and time series analysis. Statistics is a cornerstone of the campus wide data science initiative.

A coordinated MBA/professional Master of Statistics degree also is available in conjunction with the Jesse H. Jones Graduate School of Business.

Bachelor's Program
• Bachelor of Arts (BA) Degree with a Major in Statistics (ga.rice.edu/programs-study/departments-programs/engineering/statistics/statistics-ba)

Minor
• Minor in Statistics (ga.rice.edu/programs-study/departments-programs/engineering/statistics/statistics-minor)

Master's Programs
• Master of Arts (MA) Degree in the field of Statistics*
• Master of Statistics (MStat) Degree (ga.rice.edu/programs-study/departments-programs/engineering/statistics/statistics-mstat)

Doctoral Program
• Doctor of Philosophy (PhD) Degree in the field of Statistics (ga.rice.edu/programs-study/departments-programs/engineering/statistics/statistics-phd)

Coordinated Program
• Master of Business Administration (MBA) Degree / Master of Statistics (MStat) Degree (ga.rice.edu/programs-study/departments-engineering/statistics/business-administration-mba-statistics-mstat)

* Although students are not normally admitted to a Master of Arts (MA) degree program, graduate students may earn the MA as they work towards the PhD.

Chair
Marina Vannucci

Professors
Dennis Cox
Katherine B. Ensor
Rudy Guerra
Mark Kimmel
David Scott
James R. Thompson

Assistant Professors
Genevera Allen
Philip Ernst
Daniel Kowal
Meng Li
Michael Schweinberger

Professor in the Practice
John A. Dobelman
Loren Raun

Lecturer
E. Neely Atkinson

Professors, Joint Appointments
Bryan W. Brown
Mahmoud El-Gamal
Don H. Johnson
Krishna Palem
Robin Sickles
Edward E. Williams
Rick K. Wilson

Associate Professors, Joint Appointments
David M. Lane
Barbara Ostdiek

Research Professor
Erzsébet Merényi

Associate Research Professor
Janet Siefert

Adjunct Professors
Donald A. Berry
Barry Brown
Scott Cantor
Kim-Anh Do
Richard Heydorn
For Rice University degree-granting programs:
To view the list of official course offerings, please see Rice’s Course Catalog (https://courses.rice.edu/admweb/ISWKSCAT.cat?p_action=cata)
To view the most recent semester’s course schedule, please see Rice’s Course Schedule (https://courses.rice.edu/admweb/ISWKSCAT.cat)

Statistics (STAT)

STAT 280 - ELEMENTARY APPLIED STATISTICS
Short Title: ELEMENTARY APPLIED STATISTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Distribution Group: Distribution Group III
Credit Hours: 4
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Lower-Level
Description: Topics include basic probability, descriptive statistics, probability distributions, confidence intervals, significance testing, simple linear regression and correlation, association between categorized variables.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 281 - HISTORY OF NUMBERS AND GAMES OF CHANCE
Short Title: NUMBER HISTORY/GAMES OF CHANCE
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Lower-Level
Description: Starting with the colorful history of numbers, we discover their use to characterize chance or luck through probability; students will participate in one major project and submit a report application. Areas include physics, computer science, sports, finance, etc. The course is accessible to sophomores and juniors in science, engineering or business. Cross-list: COMP 281, ELEC 281.

STAT 305 - INTRODUCTION TO STATISTICS FOR BIO SCIENCES
Short Title: INTRO TO STAT FOR BIO SCIENCES
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Distribution Group: Distribution Group III
Credit Hours: 4
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): MATH 101 and MATH 102
Description: An introduction to statistics for Biosciences with emphasis on statistical models and data analysis techniques. Computer-assisted data analysis and examples, are explored in laboratory sessions. Topics include descriptive statistics, correlation and regression, categorical data analysis, statistical inference through confidence intervals and significance testing, rates, and proportions. Real-world examples are emphasized. Recommended Prerequisite(s): MATH 212.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 310 - PROBABILITY AND STATISTICS
Short Title: PROBABILITY & STATISTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Distribution Group: Distribution Group III
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): MATH 102
Description: Probability and the central concepts and methods of statistics including probability, distributions of random variables, expectation, sampling distributions, estimation, confidence intervals, and hypothesis testing. Cross-list: ECON 307. Recommended prerequisite(s): MATH 212.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 312 - PROBABILITY & STATISTICS FOR ENGINEERS
Short Title: PROB & STAT FOR ENGINEERS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Distribution Group: Distribution Group III
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): MATH 102
Description: Probability and the central concepts and methods of statistics including probability, distributions of random variables, expectation, sampling distributions, estimation, confidence intervals, and hypothesis testing. Examples are predominantly from civil and environmental engineering. Recommended Prerequisite(s): MATH 212.
STAT 313 - UNCERTAINTY AND RISK IN URBAN INFRASTRUCTURES
Short Title: UNCERT & RISK IN URBAN INFRAST
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Distribution Group: Distribution Group III
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 312 or STAT 310 or ECON 307 or ECON 382 or STAT 331 or ELEC 331
Description: Practical applications and relevance of infrastructure risk are developed in the context of real engineering problems and phenomena, including unique systems and challenges of the gulf coast area. The course starts with a survey of the roles of probability in engineering and focuses on computer-based methods, the Bayesian approach, risk analysis tools, and infrastructure safety. Cross-list: CEVE 313. Repeatable for Credit.

STAT 376 - ECONOMETRICS
Short Title: ECONOMETRICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 4
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): (ECON 209 or ECON 309 or ECON 446) and (ECON 308 or ECON 401 or ECON 477)
Description: Survey of estimation and forecasting models. Includes multiple regression time series analysis. A good understanding of linear algebra is highly desirable. Cross-list: ECON 310. Mutually Exclusive: Credit cannot be earned for STAT 376 and ECON 409/STAT 400.

STAT 385 - METHODS OF DATA ANALYSIS AND SYSTEM OPTIMIZATION
Short Title: METHODS FOR DATA ANALYSIS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Distribution Group: Distribution Group III
Credit Hours: 4
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 280 or STAT 305 or STAT 310 or ECON 307 or STAT 312
Description: The three general topic areas covered in this methodology oriented course are statistical methods including regression, sampling, and experimental design; simulation based methods in statistics, queuing and inventory problems; and an introduction to optimization methods. Excel will serve as the basic computing software.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 405 - R FOR DATA SCIENCE
Short Title: R FOR DATA SCIENCE
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Distribution Group: Distribution Group III
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 305 or STAT 312 or (STAT 310 or ECON 307 or ECON 382) or STAT 385
Description: Students will learn how to work through data science problems within the statistical programming language R. The course covers the complete analytical process, from getting your data into R, to applying appropriate exploratory and statistical analysis, and communicating the results. Important topics in data science (e.g. databases, web scraping, and big data) and efficient programming are integrated throughout the course. Graduate/Undergraduate Equivalency: STAT 605. Mutually Exclusive: Credit cannot be earned for STAT 405 and STAT 605.

STAT 410 - LINEAR REGRESSION
Short Title: LINEAR REGRESSION
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 4
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 310 or STAT 312 or ECON 307 or ECON 382
Description: An introduction to linear regression and its applications. Topics include simple and multiple linear regression, least squares, analysis of variance, model selection, diagnostics, remedial measures. Applications to real data using statistical software are emphasized. Recommended Prerequisite(s): CAAM 335 or MATH 355.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 411 - ADVANCED STATISTICAL METHODS
Short Title: ADVANCED STATISTICAL METHODS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): (STAT 310 or STAT 312 or ECON 307 or ECON 382) and (STAT 410 or STAT 615)
Description: Advanced topics in statistical applications such as sampling, experimental design and statistical process control. STAT 411 will have assignments and examinations focusing more on basic concepts than on theoretical methods. Graduate/Undergraduate Equivalency: STAT 616. Mutually Exclusive: Credit cannot be earned for STAT 411 and STAT 616.
Course URL: statistics.rice.edu/feed/Courses.aspx
STAT 413 - INTRODUCTION TO STATISTICAL MACHINE LEARNING
Short Title: INTRO TO STAT MACHINE LEARNING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 410 and STAT 405 or CAAM 210 or COMP 140 or COMP 130
Description: This course is an introduction to concepts, methods, and best practices in statistical machine learning. Topics covered include regularized regression, classification, kernels, dimension reduction, clustering, trees, and ensemble learning. Emphasis will be placed on applied data analysis and computation. Recommended Prerequisite(s): STAT 411 and CAAM 335 or MATH 354 or MATH 355.

STAT 418 - PROBABILITY
Short Title: PROBABILITY
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: Topics include random variables, distributions, transformations, moment generating functions, common families of distributions, independence, sampling distributions, and basic stochastic processes. STAT 418 will have assignments and examinations focusing more on basic concepts than on theoretical methods. Graduate/Undergraduate Equivalency: STAT 518. Mutually Exclusive: Credit cannot be earned for STAT 418 and STAT 518.

STAT 419 - STATISTICAL INFERENCEx
Short Title: STATISTICAL INFERENCEx
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): (MATH 354 or MATH 355 or CAAM 335) and STAT 418
Description: Topics include principles of data reduction, point estimation, hypothesis testing, interval estimation, Bayesian inference, Decision Theory, inference foundations of analysis of variance and regression. STAT 419 will have assignments and examinations focusing more on basic concepts than on theoretical methods. Graduate/Undergraduate Equivalency: STAT 519. Mutually Exclusive: Credit cannot be earned for STAT 419 and STAT 519.

STAT 421 - APPLIED TIME SERIES AND FORECASTING
Short Title: APPLIED TIME SERIES/FORECASTNG
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 410
Description: Applied time series modeling and forecasting, with applications to financial markets. STAT 621 is a graduate version of STAT 421 with advanced assignments. Graduate/Undergraduate Equivalency: STAT 621. Recommended Prerequisite(s): STAT 410. Mutually Exclusive: Credit cannot be earned for STAT 421 and STAT 621.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 423 - PROBABILITY IN BIOINFORMATICS AND GENETICS
Short Title: PROB BIOINFORMATICS & GENETICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 310 or STAT 312 or STAT 418
Description: Course introduces the student to modern biotechnology and genomic data. Statistical methods to analyze genomic data are covered, including probability models, basic stochastic processes, and statistical modeling. Biological topics include DNA sequence analysis, phylogenetic inference, gene finding, and molecular evolution. Graduate/Undergraduate Equivalency: STAT 623. Mutually Exclusive: Credit cannot be earned for STAT 423 and STAT 623.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 425 - INTRODUCTION TO BAYESIAN INFERENCE
Short Title: INTRO TO BAYESIAN INFERENCE
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 410 and STAT 405 or COMP 210 or COMP 140 or COMP 130
Description: This course is an introduction to Bayesian inference, with emphasis on concepts and methods for analyzing data. We will consider a variety of models, including MCMC algorithms and methods for linear regression and hierarchical models. Computational methods will be emphasized. Recommended Prerequisite(s): STAT 411 or CAAM 335 or MATH 355.
STAT 440 - STATISTICS FOR BIOENGINEERING
Short Title: STATISTICS FOR BIOENGINEERING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hour: 1
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): MATH 211 and MATH 212 and (ECON 400 or STAT 400 or ECON 409 or STAT 410) or STAT 310 or ECON 307 or STAT 312 or STAT 331 or ELEC 331
Description: This course covers application of statistics to bioengineering. Topics include descriptive statistics, estimation, hypothesis testing, ANOVA, and regression. Offered first five weeks of the semester. BIOE 252 may be taken concurrently with STAT 440. BIOE 440/STAT 440 and BIOE 439 cannot both be taken for credit. Cross-list: BIOE 440. Mutually Exclusive: Credit cannot be earned for STAT 440 and BIOE 439.

STAT 449 - QUANTITATIVE FINANCIAL RISK MANAGEMENT
Short Title: QUAN FINANCIAL RISK MANAGEMENT
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): MATH 211 and MATH 212 and (ECON 400 or STAT 400 or ECON 409 or STAT 410) or STAT 310 or ECON 307 or STAT 312 or STAT 331 or ELEC 331
Description: This course covers the use of financial securities and derivatives to take or hedge financial risk positions. Most commonly used instruments, from simple forwards and futures to exotic options and swaptions are covered. The pricing of derivatives securities will also be studied, but the emphasis will be on the mechanics and uses of financial engineering methods. STAT 449 is mutually exclusive to ECON 449. Credit cannot be given for both. Graduate/Undergraduate Equivalency: STAT 649. Mutually Exclusive: Credit cannot be earned for STAT 449 and ECON 449.

STAT 450 - SENIOR CAPSTONE PROJECT
Short Title: SENIOR CAPSTONE PROJECT
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 1-3
Restrictions: Enrollment limited to students with a class of Senior. Enrollment is limited to students with a major in Statistics. Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: Students engage in individual or team-oriented statistical projects to solve problems motivated by theory, computation, or application to real problems and data. Typical projects involve statistical modeling, data analysis, and computing to answer substantive questions in engineering or the physical, biological, or social sciences. Participants attend regular seminars addressing project development, research techniques and effective written and verbal communication skills in presenting statistical results. Repeatable for Credit.

STAT 453 - BIOSTATISTICS
Short Title: BIOSTATISTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 410
Description: An overview of statistical methodologies useful in the practice of Biostatistics. Topics include epidemiology, rates, and proportions, categorical data analysis, regression, and logistic regression, retrospective studies, case-control studies, survival analysis. Real biomedical applications serve as context for evaluating assumptions of statistical methods and models. R serves as the computing software. Graduate/Undergraduate Equivalency: STAT 553. Mutually Exclusive: Credit cannot be earned for STAT 453 and STAT 553.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 470 - FROM SEQUENCE TO STRUCTURE: AN INTRODUCTION TO COMPUTATIONAL BIOLOGY
Short Title: FROM SEQUENCE TO STRUCTURE
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 4
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: Contemporary introduction to problems in computational biology spanning sequence to structure. The course has three modules: the first introduces students to the design and statistical analysis of gene expression studies; the second covers statistical machine learning techniques for understanding experimental data generated in computational biology; and the third introduces problems in the modeling of protein structure using computational methods from robotics. The course is project oriented with an emphasis on computation and problem-solving. Cross-list: BIOE 470, COMP 470. Recommended Prerequisite(s): COMP 280 and (STAT 310 or STAT 331).
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 482 - QUANTITATIVE FINANCIAL ANALYTICS
Short Title: QUANT FINANCIAL ANALYTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: A modern approach to fundamental analytics of securities, the classic works of Graham and Dodd. Deconstructing the Efficient Market Hypothesis Financial Statement Analysis, Capital Market Theory, CAPM, APT, Fama-French Empirical Financial Forecasting. Graduate/Undergraduate Equivalency: STAT 682. Mutually Exclusive: Credit cannot be earned for STAT 482 and STAT 682.
STAT 484 - ENVIRONMENTAL RISK ASSESSMENT & HUMAN HEALTH
Short Title: ENVIRON RISK ASSESS&HUMAN HLTH
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 280 or STAT 305
Description: Learn and apply quantitative risk assessment methodology to estimate human health risk from environmental exposure to contamination in air, soil and water. Students will conduct a series of team projects focused on toxicology, risk based screening levels, exposure concentration estimation and risk characterization. Cross-list: CEVE 484. Graduate/Undergraduate Equivalency: STAT 684. Mutually Exclusive: Credit cannot be earned for STAT 484 and STAT 684.

STAT 485 - ENVIRONMENTAL STATISTICS AND DECISION MAKING
Short Title: ENVIR STAT & DECISION MAKING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 305 or STAT 385
Description: A project oriented computer intensive course focusing on statistical and mathematical solutions and investigations for the purpose of environmental decisions. This course is the undergraduate version of STAT 685 with reduced requirements. Graduate/Undergraduate Equivalency: STAT 685. Recommended Prerequisites: STAT 305 and STAT 385. Mutually Exclusive: Credit cannot be earned for STAT 485 and STAT 685.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 486 - MARKET MODELS
Short Title: MARKET MODELS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 310 or ECON 307 or ECON 382 or STAT 312
Description: This course takes the classical efficient market models and superimposes upon it models for other stochastic phenomena not generally accounted for in efficient market theory, showing how risk is lessened by portfolios and other mechanisms. This undergraduate course uses computer simulations as an alternative to closed form solutions. Graduate/Undergraduate Equivalency: STAT 686. Mutually Exclusive: Credit cannot be earned for STAT 486 and STAT 686.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 487 - ENVIRONMENTAL RISK ASSESSMENT & HUMAN HEALTH
Short Title: ENVIRON RISK ASSESS&HUMAN HLTH
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Prerequisite(s): STAT 280 or STAT 305
Description: Learn and apply quantitative risk assessment methodology to estimate human health risk from environmental exposure to contamination in air, soil and water. Students will conduct a series of team projects focused on toxicology, risk based screening levels, exposure concentration estimation and risk characterization. Cross-list: CEVE 484. Graduate/Undergraduate Equivalency: STAT 684. Mutually Exclusive: Credit cannot be earned for STAT 484 and STAT 684.

STAT 490 - INDEPENDENT STUDY
Short Title: INDEPENDENT STUDY
Department: Statistics
Grade Mode: Standard Letter
Course Type: Independent Study
Credit Hours: 1-6
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: Repeatable for Credit.
Course URL: www.statistics.rice.edu

STAT 491 - INDEPENDENT STUDY
Short Title: INDEPENDENT STUDY
Department: Statistics
Grade Mode: Standard Letter
Course Type: Independent Study
Credit Hours: 6
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: Repeatable for Credit.

STAT 496 - RTG CROSS-TRAINING IN DATA SCIENCE
Short Title: RTG CROSS-TRAINING IN DATA SCI
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to students with a major in Computer Science or Statistics. Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: A seminar course to introduce students to topics in Data Science at the interface between Statistics and Computer Science. Students participate in the process of preparing, delivering and critiquing talks. Topics change each semester. Cross-list: COMP 496. Graduate/Undergraduate Equivalency: STAT 696. Mutually Exclusive: Credit cannot be earned for STAT 496 and STAT 696. Repeatable for Credit.

STAT 499 - MATHEMATICAL SCIENCES SEMINAR
Short Title: RESEARCH THEMES IN MATH. SCI
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 1-3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: A seminar course to introduce students to topics in Data Science at the interface between Statistics and Computer Science. Students participate in the process of preparing, delivering and critiquing talks. Topics change each semester. Cross-list: COMP 496. Graduate/Undergraduate Equivalency: STAT 696. Mutually Exclusive: Credit cannot be earned for STAT 496 and STAT 696. Repeatable for Credit.

STAT 498 - RESEARCH THEMES IN THE MATHEMATICAL SCIENCES
Short Title: RESEARCH THEMES IN THE MATHEMATICAL SCIENCES
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 1-3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: A seminar course that will cover selected themes of general research in the mathematical sciences from the perspectives of mathematics, computational and applied mathematics and statistics. The course may be repeated multiple times for credit. Cross-list: MATH 498, CAAM 498. Graduate/Undergraduate Equivalency: STAT 698. Mutually Exclusive: Credit cannot be earned for STAT 498 and STAT 698. Repeatable for Credit.

STAT 900 - MATHEMATICAL SCIENCES SEMINAR
Short Title: MATHEMATICAL SCIENCES SEMINAR
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 1-3
Restrictions: Graduate level students may not enroll.
Course Level: Undergraduate Upper-Level
Description: A seminar course that will cover selected themes of general research in the mathematical sciences from the perspectives of mathematics, computational and applied mathematics and statistics. The course may be repeated multiple times for credit. Cross-list: MATH 498, CAAM 498. Graduate/Undergraduate Equivalency: STAT 698. Mutually Exclusive: Credit cannot be earned for STAT 498 and STAT 698. Repeatable for Credit.
STAT 502 - NEURAL MACHINE LEARNING I
Description: Modern Topics in Bayesian Statistics.
Prerequisite(s): STAT 522 or STAT 519
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Course Type: Lecture/Laboratory
Credit Hours: 3

STAT 509 - ADVANCED PSYCHOLOGICAL STATISTICS I
Description: Theory, inference foundations of analysis of variance and regression.
Prerequisite(s): STAT 419. Mutually Exclusive: Credit cannot be earned for STAT 519 and STAT 418.
Restrictions: Enrollment is limited to students with a major in Psychology. Enrollment is limited to Graduate level students.
Course Level: Graduate
Course Type: Lecture
Credit Hours: 3

STAT 510 - ADVANCED PSYCHOLOGICAL STATISTICS II
Description: Introduction to inferential statistics, with emphasis on analysis of variance. Students who do not meet registration requirements as Graduate and Psychology Majors must receive instructor permission to register. Cross-list: PSYC 502.
Restrictions: Enrollment limited to students with a class of Graduate. Enrollment is limited to students with a major in Psychology. Enrollment is limited to Graduate level students.
Course Level: Graduate
Course Type: Lecture
Credit Hours: 3

STAT 514 - INTRODUCTION TO BIOSTATISTICS
Description: Modern Topics in Bayesian Statistics.
Prerequisite(s): STAT 522 or STAT 509
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Course Type: Lecture/Laboratory
Credit Hours: 3

STAT 518 - PROBABILITY
Description: Topics include random variables, distributions, transformations, moment generating functions, common families of distributions, independence, sampling distributions, and basic stochastic processes. STAT 518 will have more advanced assignments and examinations focusing on theoretical methods. Graduate/Undergraduate Equivalency: STAT 418. Mutually Exclusive: Credit cannot be earned for STAT 518 and STAT 418.
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Course Type: Lecture
Credit Hours: 3

STAT 519 - STATISTICAL INFERENCE
Description: Topics include principles of data reduction, point estimation, hypothesis testing, interval estimation, Bayesian inference, Decision Theory, inference foundations of analysis of variance and regression. STAT 519 will have more advanced assignments and examinations focusing on theoretical methods. Graduate/Undergraduate Equivalency: STAT 419. Mutually Exclusive: Credit cannot be earned for STAT 519 and STAT 419.
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 518

STAT 522 - ADVANCED BAYESIAN STATISTICS
Description: Modern Topics in Bayesian Statistics.
Prerequisite(s): STAT 422 or STAT 522
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate

STAT 523 - TOPICS IN METHODS AND DATA ANALYSIS
Description: Review of major neural machine learning (Artificial Neural Network) paradigms. Analytical discussion of supervised and unsupervised neural learning algorithms and their relation to information theoretical methods. Practical applications to data analysis such as pattern recognition, clustering, classification, function approximation/regression, non-linear PCA, projection pursuit, independent component analysis, with lots of examples from image and digital processings. Details are posted at www.ece.rice.edu/~erzsebet/ANNcourse.html.
Restrictions: Enrollment limited to students with a class of Graduate.
Course Level: Graduate
Course Type: Lecture
Credit Hours: 3

STAT 526 - ADVANCED PSYCHOLOGICAL STATISTICS III
Description: Modern Topics in Bayesian Statistics.
Prerequisite(s): STAT 522 or STAT 519
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Course Type: Lecture/Laboratory
Credit Hours: 3
STAT 525 - BAYESIAN STATISTICS
Short Title: BAYESIAN STATISTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This course covers Bayesian Inference and methods for analyzing data. The emphasis will be on applied data analysis rather than theoretical development. We will consider a variety of models, including linear regression, hierarchical models, and models for categorical data. Recommended Prerequisite(s): STAT 519 and STAT 615 and STAT 605.

STAT 532 - FOUNDATIONS OF STATISTICAL INFERENCE I
Short Title: FOUNDATIONS OF STAT INF I
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 519
Description: The first semester in a two-semester sequence in mathematical statistics: random variables, distributions, small and large sample theorems of decision theory and Bayesian methods, hypothesis testing, point estimation, and confidence intervals; topics such as exponential families, univariate and multivariate linear models, and nonparametric inference will also be discussed. Required for graduate students in statistics.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 533 - FOUNDATIONS OF STATISTICAL INFERENCE II
Short Title: FOUNDATIONS OF STAT INF II
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 532
Description: A continuation of STAT 532. Required for Ph.D. students in statistics.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 540 - PRACTICUM IN STATISTICAL MODELING
Short Title: STATISTICAL MODELING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 2
Restrictions: Enrollment is limited to students with a major in Statistics. Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This course introduces current theoretical and applied problems encountered in statistical practice. The content changes each semester in response to contemporary topics. Designed for graduate students in statistics. Repeatable for Credit.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 545 - GLM & CATEG'L DATA ANALYSIS
Short Title: GLM & CATEG'L DATA ANALYSIS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 519 or STAT 615 or STAT 410
Description: Study of multivariate data analysis and theory. Topics include normal theory, principal components, factor analysis, discrimination, estimation and hypothesis testing, multivariate analysis of variance and regression clustering.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 546 - SIMULATION
Short Title: SIMULATION
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 410 or STAT 615
Description: Topics in stochastic simulation including; random number generators; Monte Carlo methods, resampling methods, Markov Chain Monte Carlo, importance sampling and simulation based estimation for stochastic processes.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 547 - SURVIVAL ANALYSIS
Short Title: SURVIVAL ANALYSIS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 519 or STAT 615 or STAT 410
Description: Contingency tables, association parameters, chi-squared tests, general theory of generalized linear models, logistics regression, loglinear models, poisson regression.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 548 - MULTIVARIATE ANALYSIS
Short Title: MULTIVARIATE ANALYSIS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 519 and STAT 615
Description: Study of multivariate data analysis and theory. Topics include normal theory, principal components, factor analysis, discrimination, estimation and hypothesis testing, multivariate analysis of variance and regression clustering.
Course URL: statistics.rice.edu/feed/Courses.aspx
STAT 549 - FUNCTIONAL DATA ANALYSIS
Short Title: FUNCTIONAL DATA ANALYSIS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 533 and STAT 581
Description: Statistical methods for functional data; spaces of functions; pre-processing of functional data; probability models for functional data; basis representations including spline functions, orthogonal bases such as wavelets, and functional principal components; methods of inference for functional data including both frequentist and Bayesian methods.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 550 - NONPARAMETRIC FUNCTION ESTIMATION
Short Title: NONPARAMETRIC FUNCTION EST
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Survey of topics in data analysis including data visualization, multivariate density estimation, and nonparametric regression. Advanced applications will include clustering, discrimination, dimension reduction, and bump-hunting using nonparametric density procedures.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 551 - ADVANCED TOPICS IN TIME SERIES
Short Title: ADVANCED TOPICS IN TIME SERIES
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 552 or STAT 621 or STAT 622
Description: The course will cover current topics in both modeling and forecasting discrete and continuous time series. A brief coverage will also be given to spatial and spatial-temporal processes.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 552 - APPLIED STOCHASTIC PROCESSES
Short Title: APPLIED STOCHASTIC PROCESSES
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 518
Description: This course covers the theory of some of the most frequently used stochastic processes in application; discrete and continuous time, Markov chains, Poisson and renewal processes, and Brownian motion.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 553 - BIOSTATISTICS
Short Title: BIOSTATISTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 615
Description: Same as STAT 453 with advanced problem sets. Graduate/Undergraduate Equivalency: STAT 453. Mutually Exclusive: Credit cannot be earned for STAT 553 and STAT 453.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 581 - MATHEMATICAL PROBABILITY I
Short Title: MATHEMATICAL PROBABILITY I
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 582 - MATHEMATICAL PROBABILITY II
Short Title: MATHEMATICAL PROBABILITY II
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 581
Description: Continuation of STAT 581.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 583 - INTRODUCTION TO RANDOM PROCESSES AND APPLICATIONS
Short Title: INTRO RANDOM PROCESSES & APPL
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Review of basic probability; Sequences of random variables; Random vectors and estimation; Basic concepts of random processes; Random processes in linear systems, expansions of random processes; Wiener filtering; Spectral representation of random processes, and white-noise integrals. Cross-list: CAAM 583, ELEC 533.

STAT 590 - INDEPENDENT STUDY
Short Title: INDEPENDENT STUDY
Department: Statistics
Grade Mode: Standard Letter
Course Type: Independent Study
Credit Hours: 1-15
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Repeatable for Credit.
STAT 591 - INDEPENDENT STUDY
Short Title: INDEPENDENT STUDY
Department: Statistics
Grade Mode: Standard Letter
Course Type: Independent Study
Credit Hours: 1-6
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Repeatable for Credit.

STAT 600 - GRADUATE SEMINAR IN STATISTICS
Short Title: GRADUATE SEMINAR IN STATISTICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to students with a major in Statistics. Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Students participate in the process of researching professional literature (journal articles, book chapters, dissertations), preparing, delivering and critiquing talks. Literature topics change each semester. Repeatable for Credit.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 601 - STATISTICS COLLOQUIUM
Short Title: STATISTICS COLLOQUIUM
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 1
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Repeatable for Credit.

STAT 602 - NEURAL MACHINE LEARNING AND DATA MINING II
Short Title: NEURAL MACHINE LEARNING II
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): ELEC 502 or COMP 502 or STAT 502
Description: Advanced topics in ANN theories, with a focus on learning high-dimensional complex manifolds with neural maps (Self-Organizing Maps, Learning Vector Quantizers and variants). Application to data mining, clustering, classification, dimension reduction, sparse representation. The course will be a mix of lectures and seminar discussions with active student participation, based on most recent research publications. Students will have access to professional software environment to implement theories. Cross-list: COMP 602, ELEC 602. Repeatable for Credit.
Course URL: www.ece.rice.edu/~erzsebet/NMLcourseII.html

STAT 604 - COMPUTATIONAL ECONOMICS
Short Title: COMPUTATIONAL ECONOMICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment limited to students with a class of Graduate. Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This course covers numerical methods most commonly used in Economics, including solving systems of equations, numerical optimization, stochastic dynamic programming, numerical differentiation and integration, monte carlo methods, and solving ordinary and partial differential equations. Cross-list: ECON 504.

STAT 605 - R FOR DATA SCIENCE
Short Title: R FOR DATA SCIENCE
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Students will learn how to work through data science problems within the statistical programming language R. The course covers the complete analytical process, from getting your data into R, to applying appropriate exploratory and statistical analysis, and communicating the results. Important topics in data science (e.g. databases, web scraping, and big data) and efficient programming are integrated throughout the course. STAT 605 includes more advanced assignments and/or examinations than STAT 405. Graduate/Undergraduate Equivalency: STAT 405. Mutually Exclusive: Credit cannot be earned for STAT 605 and STAT 405.

STAT 606 - SAS STATISTICAL PROGRAMMING
Short Title: SAS STATISTICAL PROGRAMMING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Laboratory
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This course will cover the following: (1) DATA step including arrays, merging, do-loop processing, if then else statements, set statements importing and exporting, space optimization, (2) PROC TABULATE and PROC REPORT, (3) Brief functions survey, e.g. random number generators, character and mathematical functions, time and data functions etc., (4) Formats, (5) Brief survey of statistical PROC’s, (6) SAS ODS (Output Delivery System) from statistical procedures, (7) Output datasets from statistical procedures, (8) PROC GRAPH and Statistical Graphics Procedures (SGPLOT, SGPANEL, SGSCATTER), (9) PROC SQL (includes built-in short course on basic SQL), (10) PROC IML including functions, subroutines and optimization etc., (11) Macro programming facility. Priority registration is given to STAT majors.
STAT 610 - ECONOMETRICS I
Short Title: ECONOMETRICS I
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Estimation and inference in single equation regression models, multicollinearity, autocorrelated and heteroskedastic disturbances, distributed lags, asymptotic theory, and maximum likelihood techniques. Emphasis is placed on the ability to analyze critically the literature. Cross-list: ECON 510.

STAT 611 - ECONOMETRICS II
Short Title: ECONOMETRICS II
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to students with a class of Graduate.
Course Level: Graduate
Description: Topics in linear and nonlinear simultaneous equations estimation, including qualitative and categorical dependent variables models and duration analysis. Applied exercises use SAS and the Wharton Quarterly Econometric Model. Cross-list: ECON 511.

STAT 613 - STATISTICAL MACHINE LEARNING
Short Title: STAT MACHINE LEARNING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This course is an advanced survey of statistical machine learning theory and methods. Emphasis will be placed methodological, theoretical, and computational aspects of tools such as regularized regression, classification, kernels, dimension reduction, clustering, graphical models, trees, and ensemble learning. Recommended Prerequisite(s): STAT 615 and STAT 605 and STAT 519.

STAT 615 - REGRESSION AND LINEAR MODELS
Short Title: REGRESSION AND LINEAR MODELS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: A survey of regression, linear models, and experimental design. Topics include simple and multiple linear regression, single- and multi-factor studies, analysis of variance, analysis of covariance, model selection, diagnostics. Data analysis using statistical software is emphasized.
Course URL: ece.rice.edu/~erzsebet/STAT615.html

STAT 616 - ADVANCED STATISTICAL METHODS
Short Title: ADVANCED STATISTICAL METHODS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 615
Description: Advanced topics in statistical applications such as sampling, experimental design and statistical process control. STAT 616 will have more advanced assignments and examinations focusing on theoretical methods. Graduate/Undergraduate Equivalency: STAT 411. Mutually Exclusive: Credit cannot be earned for STAT 616 and STAT 411.

STAT 620 - SPECIAL TOPICS
Short Title: SPECIAL TOPICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Seminar on advanced topics in Statistics. Repeatable for Credit.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 621 - APPLIED TIME SERIES AND FORECASTING
Short Title: APPLIED TIME SERIES/FORECASTING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 615 (may be taken concurrently)
Description: Applied time series modeling and forecasting, with applications to financial markets with advanced problem sets. This is a graduate version of STAT 421 with advanced assignments. The courses STAT 615 and STAT 431 may be taken concurrently with STAT 621 if courses are not in history. Graduate/Undergraduate Equivalency: STAT 421. Mutually Exclusive: Credit cannot be earned for STAT 621 and STAT 421.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 623 - PROBABILITY IN BIOINFORMATICS AND GENETICS
Short Title: PROB BIOINFORMATICS & GENETICS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): STAT 310 or STAT 312 or ECON 307 or ECON 382) and (MATH 355 or CAAM 335
Description: Course introduces the student to modern biotechnology and genomic data. Statistical methods to analyze genomic data are covered, including probability models, basic stochastic processes, and statistical modeling. Biological topics include DNA sequence analysis, phylogenetic inference, gene finding, and molecular evolution. Graduate/Undergraduate Equivalency: STAT 423. Mutually Exclusive: Credit cannot be earned for STAT 623 and STAT 423.
Course URL: statistics.rice.edu/feed/Courses.aspx
Equivalency: STAT 449.

The course covers the use of financial securities and derivatives to take or hedge financial risk positions. Most commonly used instruments, from simple forwards and futures to exotic options and swaptions are covered. The pricing of derivatives securities will also be studied, but the emphasis will be on the mechanics and uses of financial engineering methods. Students receiving graduate credit in STAT 649 will be expected to address additional homework and test questions targeting a graduate level understanding of the material. Graduate/Undergraduate Equivalency: STAT 449.
STAT 685 - ENVIRONMENTAL STATISTICS AND DECISION MAKING
Short Title: ENVIR STAT & DECISION MAKING
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Prerequisite(s): STAT 305 or STAT 385
Description: A project oriented computer intensive course focusing on statistical and mathematical solutions and investigations for the purpose of environmental decisions. This course is required for EADM students. Graduate/Undergraduate Equivalency: STAT 485. Mutually Exclusive: Credit cannot be earned for STAT 685 and STAT 485.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 686 - MARKET MODELS
Short Title: MARKET MODELS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Prerequisite(s): STAT 518 and (STAT 615 or STAT 410)
Description: This course takes the classical efficient market models and superimposes upon it models for other stochastic phenomena not generally accounted for in efficient market theory, showing how risk is lessened by portfolios and other mechanisms. This graduate course uses computer simulations as an alternative to closed form solutions with advanced problem sets. Graduate/Undergraduate Equivalency: STAT 486. Mutually Exclusive: Credit cannot be earned for STAT 686 and STAT 486.
Course URL: statistics.rice.edu/feed/Courses.aspx

STAT 696 - RTG CROSS-TRAINING IN DATA SCIENCE
Short Title: RTG CROSS-TRAINING IN DATA SCI
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to students with a major in Computer Science or Statistics. Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: A seminar course to introduce students to topics in Data Science at the interface between Statistics and Computer Science. Students participate in the process of preparing, delivering and critiquing talks. Topics change each semester. Cross-list: COMP 696. Graduate/Undergraduate Equivalency: STAT 496. Mutually Exclusive: Credit cannot be earned for STAT 696 and STAT 496. Repeatable for Credit.

STAT 698 - RESEARCH THEMES IN THE MATHEMATICAL SCIENCES
Short Title: RESEARCH THEMES IN MATH. SCI.
Department: Statistics
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 1-3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: A seminar course that will cover selected theme of general research in the mathematical sciences from the perspectives of mathematics, computational and applied mathematics and statistics. The course may be repeated multiple times for credit. Cross-list: CAAM 698, MATH 698. Graduate/Undergraduate Equivalency: STAT 498. Mutually Exclusive: Credit cannot be earned for STAT 698 and STAT 498. Repeatable for Credit.
Course URL: www.statistics.rice.edu

STAT 800 - THESIS
Short Title: THESIS
Department: Statistics
Grade Mode: Standard Letter
Course Type: Research
Credit Hours: 1-15
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Repeatable for Credit.

Description and Code Legend
Note: Internally, the university uses the following descriptions, codes, and abbreviations for this academic program. The following is a quick reference:

Course Catalog/Schedule
• Course offerings/subject code: STAT

Department Description and Code
• Statistics: STAT

Undergraduate Degree Description and Code
• Bachelor of Arts Degree: BA

Undergraduate Major Description and Code
• Major in Statistics: STAT

Undergraduate Minor Description and Code
• Minor in Statistics: STAS

Graduate Degree Descriptions and Codes
• Master of Arts degree: MA
• Master of Statistics degree: MStat
• Doctor of Philosophy degree: PhD

Graduate Degree Program Description and Code

• Degree Program in Statistics: STAT