STATISTICS (STAT)

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STAT Courses

STAT 1000 Statistical and Data Literacy (3 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4

Using data to answer questions, with emphasis on working with tabular data in spreadsheet software to provide insights via descriptions and visualizations. Data sources, sampling, collecting data. Multivariable thinking, analysis, and visualization. Decision-making when faced with uncertainty. Data ethics. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Crosslisted as DATA/STAT 1000. Formerly STAT 130.

STAT 1110 Applied Statistical Concepts and Methods (3 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MATH 115, MATH 1000, or appropriate Math Placement Level.

Data collection and experimental design, descriptive statistics, one- and two-sample confidence intervals and hypothesis tests, analysis of variance, correlation, simple linear regression, chi-square tests. Substantial use of statistical software and/or online applications. Not open to students with credit in STAT 251 or STAT 1210. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly STAT 218.

STAT 1210 Business Statistics I (3 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MATH 118, MATH 1006, or appropriate MATH Placement Level.

Descriptive statistics. Probability and counting rules. Random variables and probability distributions. Sampling distributions and point estimation. Confidence intervals and hypothesis tests for a single mean and proportion. Confidence intervals and hypothesis tests for difference between two means and two proportions. Paired-samples procedures. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly STAT 251.

STAT 1220 Business Statistics II (3 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: STAT 251 or STAT 1210 a grade of C- or better or consent of instructor.

One- and two-factor analysis of variance, simple regression, correlation, multiple regression, logistic regression, and time series. Substantial use of statistical software. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly STAT 252.

STAT 1510 Statistics I (3 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: One of the following: MATH 116, MATH 118, MATH 119, MATH 1004, MATH 1005, MATH 1006, MATH 1007, or appropriate Math Placement Level.

Introduction to the process of statistical investigations including study design, data exploration, statistical inference, and drawing appropriate conclusions. Exploration of conceptual and mathematical underpinnings of many common methods. Substantial use of statistical software. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs).

STAT 1810 Introduction to Statistical Computing with R (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: DATA/STAT 1000, STAT 130, STAT 218, STAT 252, STAT 301, STAT 312, STAT 1110, STAT 1220, STAT 1510, or STAT 3210.

Development environment and core elements of statistical computing in R. Importing and managing tabular data. Objects. Data types. Data visualizations and numerical summaries. Logical operations, iteration, and function writing. Debugging. Reproducible documents. Simulation and random number generation. Statistical inference methods. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Crosslisted as DATA/STAT 1810. Replaced STAT 331.

STAT 2200 Special Problems for Undergraduates (1-2 units)
Term Typically Offered: F, SP
Prerequisite: Consent of department chair.

Individual investigation, research, studies, or surveys of selected problems. Repeatable up to 4 units. Formerly STAT 200.

STAT 2270 Special Topics (1-3 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group study of special topics. The Class Schedule will list topic selected. Repeatable up to 6 units. Course may be offered in classroom-based, online, or hybrid format. 1 to 3 lectures. Formerly STAT 270.

STAT 2610 Introduction to Probability and Simulation (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: MATH 121, MATH 141, MATH 221, MATH 1261, MATH 1264, or MATH 1267; and one of the following: BUS 392, BUS 3392, CSC 101, CSC 1001, CSC 232, CSC 1032, STAT 331, DATA/STAT 1810, ECON 395, or ECON 3015.

Basic probability rules, counting methods, conditional probability, independence. Discrete and continuous random variables; joint, marginal, and conditional distribution; expected value, variance, covariance. Bias and precision of statistical estimators, maximum likelihood estimation. Simulation analysis of random phenomena using modern computing language. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Replaced STAT 305.

STAT 3210 Engineering Statistics (3 units)
Term Typically Offered: F, SP, SU
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Prerequisite: Junior standing or one of the following majors: CPE, CSC, EE, GENE, IE, IME, MATE, MFGE, or SE; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2020-26 catalogs); and MATH, 123, MATH 143, MATH 1262, or MATH 1265.

Descriptive and graphical methods. Introduction to probability. Discrete and continuous probability distributions. One- and two-sample confidence intervals and hypothesis testing. Experimental design and analysis of variance. Introduction to simple and multiple regression. Substantial use of statistical software. Not open to students with credit in STAT 252, STAT 302, STAT 1220, or STAT 3520. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Areas Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2020-26 catalogs). Formerly STAT 312.

STAT 3310 Probability and Random Processes for Engineers (3 units)
Term Typically Offered: F, SP
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Prerequisite: Junior standing; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2020-26 catalogs); and MATH 123, MATH 241, MATH 1265, or MATH 2263. Corequisite: EE 2328.

Random events, variables, and processes, with emphasis on probabilistic treatment of signals and noise. Probability spaces, conditional probability, independence, discrete and continuous random variables, joint, conditional, and marginal distributions. Mean, variance, covariance, and correlation. Discrete- and continuous-time random processes, wide-sense stationarity, autocorrelation, and spectral functions. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Areas Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2020-26 catalogs). Formerly STAT 350.

STAT 3320 Statistical Methods for Food Science (3 units)
Term Typically Offered: F, SP
Prerequisite: STAT 218 or STAT 1110.

Statistical methods for sensory analysis and food product development. Discrimination testing: paired, duo-trio, triangle, tetrad. Two-way ANOVA, 2^k, fractional factorial, response surface, mixture designs. Quality and process control. Not open to students with credit in STAT 302 or STAT 3520. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Formerly STAT 314.

STAT 3430 Applied Regression Analysis (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302 or STAT 3520.

Linear regression including polynomial models, categorical predictors, interactions, influence diagnostics, assumption analysis, variable selection methods, logistic regression. Not open to students with credit in STAT 334, STAT 3530, or Statistics majors. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Formerly STAT 324.

STAT 3520 Statistics II (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following with a grade of C- or better: STAT 218, STAT 1110, STAT 1510, STAT 312, or STAT 3210; and MATH 118 or MATH 1006 with a grade of C- or better, or appropriate Math Placement Level; or consent of instructor.

Process, concepts, and methods of statistical investigations for both observational studies and simple designed experiments. Multivariable thinking and explaining variation. One- and two-way analysis of variance (ANOVA); completely randomized and randomized complete block designs; simple and multiple linear regression. Substantial use of software. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Formerly STAT 302.

STAT 3530 Applied Linear Models (4 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302, or STAT 3520; and one of the following: MATH 206, MATH 1151, MATH 244, or MATH 2341.

Linear models in algebraic and matrix form, diagnostics, transformations, polynomial models, categorical predictors, model selection, correlated errors, logistic regression. Course may be offered in classroom-based, online, or hybrid format. Not open to students with credit in STAT 324 or STAT 3430. 4 lectures. Formerly STAT 334.

STAT 3540 Statistical Methods for Study Design and Analysis (4 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: STAT 252, STAT 1220, STAT 302 or STAT 3520.

Study designs to address statistical research questions. Ethical considerations when designing studies and analyzing data. Experimental designs, completely randomized, block designs, factorial, and nested designs. Survey planning, execution, and analysis. Survey research, non-sampling, and sampling errors. Use of weights in surveys. Estimate parameters and calculate sample size. Course may be offered in classroom-based, online, or hybrid format. 4 lectures. Formerly STAT 323.

STAT 3710 Teaching Statistics: Pedagogy, Content, Technology, and Assessment (3 units)
Term Typically Offered: F
Prerequisite: One of the following: STAT 130, DATA/STAT 1000, STAT 218, STAT 1110, STAT 251, STAT 1210, STAT 301, STAT 1510, STAT 312, STAT 3210, STAT 511, or STAT 5110.

Study, discuss, reflect on, and analyze issues related to the teaching of statistics for grades 6 through college in areas of content, pedagogy, technology use, and assessment. Review, critique, and implement current recommendations and national and state standards for teaching statistics. 3 lectures. Formerly STAT 410.

STAT 3800 Introduction to Statistical Computing with SAS and SQL (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302 or STAT 3520.

Using SAS to access and manage data, generate reports, and export results; graphical procedures, basic descriptive and inferential statistics. Introduction to SAS macros, and SQL for data management within the SAS environment. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Crosslisted as DATA/STAT 3800. Formerly STAT 330.

STAT 3820 Intermediate Statistical Computing with R (3 units)
Term Typically Offered: F, SP
Prerequisite: STAT 331 or STAT 1810; and one of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302 or STAT 3520.

Intermediate and advanced techniques for use of R Statistical Software to analyze data. Version control systems; reproducibility and documentation; data collection and wrangling; functional programming; randomization and bootstrapping; and dynamic data visualizations. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Crosslisted as DATA/STAT 3820. Formerly STAT 431.

STAT 4366 Statistical Communication, Collaboration, and Consulting (5 units)
Term Typically Offered: SP
Prerequisite: Junior standing; Statistics major; STAT 334 or STAT 3530; STAT 323 or STAT 3540; and STAT 431 or STAT 3820; or graduate standing in Statistics. Recommended: STAT 330 or STAT 3800.

Analyzing data and communicating results in a client-centered collaborative environment. Applying best practices in data visualization, table design, and technical report writing. Conducting effective consulting meetings with clients. Discussing client research questions and statistical ideas. Creating client deliverables. 4 lectures, 1 activity. Formerly STAT 466.

STAT 4400 Special Problems for Advanced Undergraduates (1-3 units)
Term Typically Offered: F, SP
Prerequisite: Junior standing and consent of department chair.

Individual investigation, research, studies or surveys of selected problems. Repeatable up to 4 units. Formerly STAT 400.

STAT 4460 Senior Project: Statistics Capstone (2 units)
Term Typically Offered: F, SP
Prerequisite: STAT 466 or STAT 4366.

Team-based investigation of a statistics-related research project provided by a client or collaborator, and selected by the instructor. Project management and synthesis of knowledge and skills gained throughout the Statistics major coursework. Oral or written presentation of high-quality deliverable. 2 laboratories.

STAT 4470 Special Advanced Topics (1-3 units)
Term Typically Offered: TBD
Prerequisite: Junior standing and consent of instructor.

Directed group study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 6 units. Course may be offered in classroom-based, online, or hybrid format. 1 to 3 lectures. Formerly STAT 470.

STAT 4610 Probability Theory (3 units)
Term Typically Offered: F
Prerequisite: STAT 305 or STAT 2610; and MATH 121, MATH 1264, MATH 241, or MATH 2263; or graduate standing in Statistics.

Derivations and proofs related to probability, conditional probability, random variables. Univariate and multivariate probability distributions. Conditional expectation, conditional variance, conditional independence. Moments and moment-generating functions. Transformations of random variables, order statistics. Properties of multivariate normal distributions. 3 lectures. Formerly STAT 425.

STAT 4620 Statistical Theory (3 units)
Term Typically Offered: SP
Prerequisite: STAT 425 or STAT 4610.

Central Limit Theorem and its extensions. Theory of sampling from normal population. Theory of point and interval estimators, maximum likelihood, Rao-Blackwell Theorem. Theory of hypothesis testing, uniformly most powerful tests, likelihood-ratio tests, Neyman-Pearson Lemma. Power, properties of t-tests. Introduction to Bayesian estimators and inference. 3 lectures. Formerly STAT 426.

STAT 4740 Multilevel and Mixed Modeling (3 units)
Term Typically Offered: F
Prerequisite: STAT 324, STAT 3430, STAT 334, or STAT 3530; or graduate standing in Statistics.

Overview of multilevel and mixed models, including hierarchical data, intraclass correlation, fixed vs. random coefficients, variance components, comparisons to traditional analyses. Use of statistical software for implementation of methods. 3 lectures. Formerly STAT 414.

STAT 4750 Bayesian Reasoning and Methods (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: STAT 218, STAT 1110, STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302, or STAT 3520; and one of the following: STAT 305, STAT 2610, STAT 312, STAT 3210, STAT 350, or STAT 3310; or graduate standing in Statistics. Recommended: STAT 331 or DATA/STAT 1810.

Bayesian and frequentist interpretations of probability and statistics, Bayes' theorem, prior distributions, likelihood functions, posterior distributions, predictive distributions, Markov Chain Monte Carlo simulation methods. Bayesian modeling and data analysis, inference, prediction, hierarchical modeling, comparison of Bayesian and frequentist approaches. 3 lectures. Formerly STAT 415.

STAT 4760 Statistical Analysis of Time Series (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: STAT 324, STAT 3430, STAT 334, STAT 3530, STAT 524, or STAT 5430; or graduate standing in Statistics.

Time series components, descriptive smoothing methods, regression models for time series data, forecasting via exponential smoothing, evaluation of forecasts, autocorrelation, ARIMA models, and Box-Jenkins methods. 3 lectures. Formerly STAT 416.

STAT 4770 Survival Analysis Methods (3 units)
Term Typically Offered: F
Prerequisite: One of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302, or STAT 3520; and MATH 143, MATH 1262, MATH 123, MATH 1265, MATH 221, or MATH 1267; or graduate standing in Statistics.

Parametric and nonparametric methods for analyzing survival data. Kaplan-Meier and Nelson-Aalen estimates, Cox regression models, and accelerated failure time models. Use of statistical software to implement methods throughout course. 3 lectures. Formerly STAT 417.

STAT 4780 Categorical Data Analysis (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: STAT 324, STAT 3430, STAT 334, or STAT 3530; or graduate standing in Statistics.

Discrete multivariate statistics, including analysis of cross-classified and matched-pairs data, multi-category and ordinal logistic models, log-linear models for multidimensional contingency tables, goodness of fit statistics, measures of association, model selection, hypothesis testing and confidence intervals, and exact procedures. 3 lectures. Formerly STAT 418.

STAT 4790 Applied Multivariate Statistics (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302, STAT 3520, STAT 542, or STAT 5210; and one of the following MATH 206, MATH 1151, MATH 244, MATH 2341; or graduate standing in Statistics.

Continuous multivariate statistics. Tests on mean vectors, multivariate analysis of variance, principal components and factor analysis, discriminant analysis, clustering, classification, and canonical correlation. Use of statistical software throughout the course. 3 lectures. Formerly STAT 419.

STAT 4810 SAS Certification Preparation: Base Programming (1 unit)
Term Typically Offered: TBD
Prerequisite: STAT 330 or STAT 3800; or graduate standing in Statistics.

Preparation for the Base Programming Specialist SAS certification exam offered by the SAS Institute. Includes using SAS to access and manage data, generate reports, and export results. 1 lecture. Crosslisted as DATA/STAT 4810. Formerly STAT 440.

STAT 4820 SAS Certification Preparation: Advanced Programming (2 units)
Term Typically Offered: TBD
Prerequisite: STAT 440 or STAT 4810.

Preparation for the Advanced Programming Professional SAS certification exam offered by the SAS Institute. Includes accessing and managing data using PROC SQL, macro processing, and using advanced SAS programming techniques such as arrays and hash objects. 2 lectures. Crosslisted as DATA/STAT 4820. Formerly STAT 441.

STAT 5110 Introductory Statistics for Graduate Students (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing and intermediate algebra or equivalent.

Statistical methods in research for graduate students not majoring in mathematical sciences. Probability distributions, confidence intervals, hypothesis testing, contingency tables, linear regression and correlation, analysis of variance. Substantial use of statistical software. 3 lectures. Formerly STAT 511.

STAT 5120 Intermediate Statistics for Graduate Students (3 units)
Term Typically Offered: F, SP
Prerequisite: Graduate standing; and one of the following: STAT 218, STAT 1110, STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 511, or STAT 5110 with a grade or C- or better or consent of instructor.

Applications of statistics for graduate students outside the discipline of statistics. Analysis of variance including one-way classification, randomized blocks, and factorial designs. Introduction to multiple regression and analysis of covariance. Not open to students with credit in STAT 302 or STAT 3520, or Statistics majors. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Formerly STAT 513.

STAT 5210 Introduction to Engineering Statistics for Graduate Students (3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Graduate standing; and univariate calculus or equivalent.

Descriptive and graphical methods. Introduction to probability. Discrete and continuous probability distributions. One- and two-sample confidence intervals and hypothesis testing. Experimental design and analysis of variance. Introduction to simple and multiple regression. Substantial use of statistical software. Not open to students with credit in STAT 252, STAT 1220, STAT 312, or STAT 3210. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Formerly STAT 542.

STAT 5430 Applied Regression Analysis for Graduate Students (3 units)
Term Typically Offered: F, SP
Prerequisite: Graduate standing; and one of the following: STAT 252, STAT 1220, STAT 312, STAT 3120, STAT 302, STAT 3520, STAT 513, STAT 5120, STAT 542, or STAT 5210.

Linear regression including polynomial models, categorical predictors, interactions, influence diagnostics, assumption analysis, variable selection methods, logistic regression. Not open to students with credit in STAT 324, STAT 3430, STAT 334, or STAT 3530. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Formerly STAT 524.

STAT 5440 Statistical Methods for Study Design and Analysis (4 units)
Term Typically Offered: F, SP
Prerequisite: Graduate standing; and one of the following: STAT 252, STAT 1220, STAT 302, STAT 3520, STAT 513, STAT 542, STAT 5120, or STAT 5210.

Principles of experimental design and analysis, including completely randomized, block, factorial and nested designs. Principles of survey research, including design and analysis, non-sampling and sampling errors, and weights. Ethical considerations in the design of studies and analysis of data. Not open to students with credit in STAT 323, STAT 3540, or Statistic majors. Course may be offered in classroom-based, online, or hybrid format. 4 lectures. Formerly STAT 523.

STAT 5500 Independent Study (1-3 units)
Term Typically Offered: F, SP
Prerequisite: Graduate standing and consent of department chair.

Individual research or advanced study planned and completed under the direction of a departmental faculty member. Repeatable up to 9 units. Formerly STAT 500.

STAT 5530 Generalized Linear Models (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing and STAT 426 or STAT 4620; or STAT 334 or STAT 3530, and STAT 426 or STAT 4620.

Theory and application of generalized linear models (GLMs). Linear regression, logistic regression, nominal and ordinal responses, Poisson GLMs, correlated responses, random and mixed effects models, Bayesian GLMs, model selection and model checking. 3 lectures. Formerly STAT 550.

STAT 5550 Statistical Learning with R (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing; or STAT 331 or DATA/STAT 1810; one of the following: STAT 305, STAT 2610, STAT 350, or STAT 3310; and one of the following: STAT 334, STAT 513, STAT 3530, or STAT 5120.

Modern methods in predictive modeling. Supervised and unsupervised learning. Regression, classification, and clustering methods, including SVM, LASSO, splines, trees, and random forests. Model assessment and selection using cross validation, bootstrapping, and information criteria. Use of the R programming language. Course may be offered in classroom-based or hybrid format. 3 lectures. Crosslisted as DATA/STAT 5550. Formerly STAT 551.

STAT 5566 Graduate Consulting Practicum (2 units)
Term Typically Offered: SP
Prerequisite: Graduate standing in Statistics. Recommended: STAT 466, STAT 4366, DATA 451, DATA 4460 or prior consulting experience.

Practice in statistical consulting. Observing faculty-led consulting meetings. Organizing and leading consulting projects with faculty supervision. Discussion of statistical consulting projects in a seminar format. Two seminar units. Formerly STAT 566.

STAT 5570 Special Advanced Topics (1-3 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing and consent of instructor.

Directed group study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 3 units. Course may be offered in classroom-based, online, or hybrid format. 1 to 3 lectures. Formerly STAT 570.

STAT 5590 Graduate Seminar in Statistics (1 unit)
Term Typically Offered: F, SP
Prerequisite: Graduate standing in Statistics.

Advanced statistics selected by the faculty. Discussion of current research papers in statistics and implementation of methods. Total credit limited to 2 units. 1 seminar. Formerly STAT 590.

STAT 5599 Thesis (1-3 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing and consent of instructor.

Individual research under faculty supervision, leading to a graduate thesis. Repeatable up to 5 units. Formerly STAT 599.

STAT 5710 Applied Stochastic Processes (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing; or one of the following: MATH 206, MATH 1151, MATH 244, or MATH 2341; and STAT 305 or STAT 2610.
Recommended: STAT 426 or STAT 4620.

Properties, simulation, and application of stochastic processes. Discrete-time and continuous-time Markov chains, hidden Markov models, Poisson processes, Gaussian processes, continuous-state Markov processes. Markov chain Monte Carlo (MCMC) simulation methods and applications. Estimation methods for stochastic processes. 3 lectures. Formerly STAT 545.

STAT 5740 Advanced Design and Analysis of Experiments (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing; or STAT 334 or STAT 3530; and STAT 323 or STAT 3540.

2^k factorial and fractional factorial designs, balanced and partially balanced incomplete block designs, nested designs, split-plot designs, response surfaces, repeated measures, and other design approaches. Design matrices. Analysis and interpretation of fixed, random, and mixed effects models, analysis of covariance, and different parameterizations. 3 lectures. Formerly STAT 543.

STAT 5800 Introduction to SAS and SQL for Graduate Students (3 units)
Term Typically Offered: F, SP
Prerequisite: Graduate standing; and one of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302, STAT 3520, STAT 513, STAT 5120, STAT 542, or STAT 5210.

Using SAS to access and manage data, generate reports, and export results; graphical procedures, basic descriptive and inferential statistics. Introduction to SAS macros, and SQL for data management within the SAS environment. Not open to students with credit in STAT 330, STAT 3800 or Statistics majors. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Crosslisted as DATA/STAT 5800. Formerly STAT 530.

STAT 5820 Intermediate Statistical Computing with R for Graduate Students (3 units)
Term Typically Offered: F, SP
Prerequisite: STAT 331 or STAT 1810; one of the following: STAT 252, STAT 1220, STAT 312, STAT 3210, STAT 302, or STAT 3520; and graduate standing.

Intermediate and advanced techniques for use of R Statistical Software to analyze data. Version control systems; reproducibility and documentation; data collection and wrangling; functional programming; randomization and bootstrapping; and dynamic data visualizations. Not open to Statistics majors. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Crosslisted as DATA/STAT 5820. Formerly STAT 531.