STATISTICS (STAT)

STAT 5005. Introduction to Applied Statistics. (3 Credits)
One-, two- and k-sample problems, regression, elementary factorial and repeated measures designs, covariance. Use of computer packages, e.g., SAS and MINITAB. STAT 5005 cannot be counted toward a graduate degree in Statistics or Biostatistics.
Enrollment Requirements: Not open to students who have passed STAT 2215Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205005)

STAT 5091. Statistics Internship. (1-3 Credits)
Internship course for graduate students in Statistics.
Enrollment Requirements: Instructor consent.
May be repeated for a total of 3 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205091)

STAT 5094. Seminar in Statistics. (1 Credit)
Seminar course for graduate students in Statistics.
Enrollment Requirements: Open to graduate students in Statistics.
May be repeated for a total of 3 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205094)

STAT 5095. Investigation of Special Topics. (1-3 Credits)
Topical seminar course. May be repeated for a maximum of three credits with a change of topic.
May be repeated for a total of 3 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205095)

STAT 5099. Independent Study. (1-6 Credits)
Independent study on statistics and its applications under the supervision of a faculty instructor.
May be repeated for a total of 6 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205099)

STAT 5192. Supervised Research in Statistics. (1-6 Credits)
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205192)

STAT 5215. Statistical Consulting. (3 Credits)
(Also offered as BIST 5215.) Applied inference for academia, government, and industry: ethical guidelines, observational studies, surveys, clinical trials, designed experiments, data management, aspects of verbal and written communication, case studies.
Enrollment Requirements: BIST/STAT 5315, 5505, and 5605; or instructor consent.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205215)

STAT 5225. Data Management and Programming in R and SAS. (3 Credits)
(Also offered as BIST 5225.) Creation and management of datasets for statistical analysis: software tools and databases, user-defined functions, importing/exporting/manipulation of data, conditional and iterative processing, generation of reports.
Enrollment Requirements: BIST/STAT 5505 and 5605; or instructor consent.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205225)

STAT 5255. Introduction to Data Science. (3 Credits)
Introduction to data science for effectively storing, processing, visualizing, analyzing and making inferences from data to enable decision making. Topics include project management, data preparation, data visualization, statistical modeling, machine learning, distributed computing and ethics.
Enrollment Requirements: Open to graduate students in Statistics, others with permission. Not open for credit to students who have passed STAT 3255. Recommended preparation: STAT 1000Q or 1100Q or 5005 or equivalent; STAT 2255 or equivalent; and STAT 3115Q or equivalent.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205255)

STAT 5315. Analysis of Experiments. (3 Credits)
Graded Straight-line regression, multiple regression, regression diagnostics, transformations, dummy variables, one-way and two-way analysis of variance, analysis of covariance, stepwise regression. STAT 5315 cannot be counted toward a graduate degree in Statistics or Biostatistics.
Enrollment Requirements: STAT 5005. Not open to students who have passed STAT 3115Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205315)

STAT 5361. Statistical Computing. (3 Credits)
Use of computing for statistical problems; obtaining features of distributions, fitting models and implementing inference. Basic numerical methods, nonlinear statistical methods, numerical integration, modern simulation methods.
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205361)

STAT 5405. Applied Statistics for Data Science. (3 Credits)
Statistics essential for data science incorporating descriptive statistics; integrative numerical description and visualization of data; graphical methods for determining and comparing distributions of data; data-driven statistical inference of one-sample, two-sample, and k-sample problems; linear regression; non-linear regression; and dependent data models.
Enrollment Requirements: Instructor consent and undergraduate course in statistics. Not open to students who have passed STAT 5505 or STAT 5605 or BIST 5505 or BIST 5605.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205405)

STAT 5410. Statistical Computing for Data Science. (3 Credits)
Principles and practice of statistical computing in data science: data structure, distributed computing and project management tools, data visualization, and data programming including simulation, resampling methods, and applications of optimization for statistical modeling, inference, and prediction. Formerly offered as STAT 5125.
Enrollment Requirements: Open to graduate students in the MS in Data Science program, others with permission. Introductory course in mathematical and applied statistics; introductory course in programming.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205410)

STAT 5415. Statistical Methods for Data Science. (3 Credits)
Basic probabilistic concepts; marginal, joint and conditional probability distributions; point and interval estimation; and hypothesis testing.
Enrollment Requirements: Differential calculus; undergraduate course in statistics; and Instructor consent. Not open to students who have passed STAT 5585 or STAT 5685 or BIST 5585 or BIST 5685.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205415)

STAT 5505. Applied Statistics I. (3 Credits)
(Also offered as BIST 5505.) Exploratory data analysis: stem-and leaf plots, Box-plots, symmetry plots, quantile plots, transformations, discrete and continuous distributions, goodness of fit tests, parametric and non-parametric inference for one sample and two sample problems, robust estimation, Monte Carlo inference, bootstrapping.
Enrollment Requirements: Open to graduate students in Statistics and Biostatistics; others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205505)

STAT 5515. Design of Experiments. (3 Credits)
(Also offered as BIST 5515.) One way analysis of variance, multiple comparison of means, randomized block designs, Latin and Graeco-Latin square designs, factorial designs, two-level factorial and fractional factorial designs, nested and hierarchical designs, split-plot designs.
Enrollment Requirements: STAT 5005 or statistics MA or PHD field of study. Not open to students who have passed STAT 3515Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205515)

STAT 5525. Sampling Theory. (3 Credits)
Sampling and nonsampling error, bias, sampling design, simple random sampling, sampling with unequal probabilities, stratified sampling, optimum allocation, proportional allocation, ratio estimators, regression estimators, super population approaches, inference in finite populations.
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205525)

STAT 5535. Nonparametric Methods. (3 Credits)
Theory and applications of statistical methods for analyzing ordinal, non-normal data: one and multiple sample hypothesis testing, empirical distribution functions and applications, order statistics, rank tests, efficiency, linear and nonlinear regression, classification.
Enrollment Requirements: Not open to students who have passed STAT 4875.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205535)

STAT 5545. Mathematical Statistics I. (3 Credits)
(Also offered as BIST 5545.) Introduction to probability theory, transformations and expectations, moment generating function, discrete and continuous distributions, joint and marginal distributions of random vectors, conditional distributions and independence, sums of random variables, order statistics, convergence of a sequence of random variables, the central limit theorem Formerly offered as BIST/STAT 5585.
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205545)

STAT 5555. Mathematical Statistics II. (3 Credits)
(Also offered as BIST 5555.) The sufficiency principle, the likelihood principle, the invariance principle, point estimation, methods of evaluating point estimators, hypotheses testing, methods of evaluating tests, interval estimation, methods of evaluating interval estimators. Formerly offered as BIST/STAT 5685.
Enrollment Requirements: BIST/STAT 5545.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205555)

STAT 5605. Applied Statistics II. (3 Credits)
(Also offered as BIST 5605.) Analysis of variance, regression and correlation, analysis of covariance, general liner models, robust regression procedures, and regression diagnostics.
Enrollment Requirements: BIST/STAT 5505.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205605)

STAT 5665. Applied Multivariate Analysis. (3 Credits)
Multivariate normal distributions, inference about a mean vector, comparison of several multivariate means, principal components, factor analysis, canonical correlation analysis, discrimination and classification, cluster analysis.
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205665)

STAT 5675. Bayesian Data Analysis. (3 Credits)
Theory of statistical inference based on Bayes' Theorem: basic probability theory, linear/nonlinear, graphical, and hierarchical models, decision theory, Bayes estimation and hypothesis testing, prior elicitation, Gibbs sampling, the Metropolis-Hastings algorithm, Monte Carlo integration.
Enrollment Requirements: STAT 5585 and 5685; or instructor consent.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205675)

STAT 5725. Linear Models I. (3 Credits)
Linear and matrix algebra concepts, generalized inverses of matrices, multivariate normal distribution, distributions of quadratic forms in normal random vectors, least squares estimation for full rank and less than full rank linear models, estimation under linear restrictions, testing linear hypotheses.
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205725)

STAT 5735. Linear Models II. (3 Credits)
Multiple comparisons, fixed effects linear models, random-effects and mixed-effects models, generalized linear models,variable selections, regularization and sparsity, support vector machines, additive models and Bayesian linear models.
Enrollment Requirements: STAT 5505, 5605, and 5725; open to Ph.D. students who have passed the Ph.D. Qualifying Exam in Statistics; others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205735)

STAT 5825. Applied Time Series. (3 Credits)
Introduction to prediction using time-series regression methods with non-seasonal and seasonal data. Smoothing methods for forecasting. Modeling and forecasting using univariate autoregressive moving average models.
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205825)

STAT 5845. Applied Spatio-Temporal Statistics. (3 Credits)
Applied statistical methodology and computing for spatio-temporal data, including visualization, models, and inferences. Extreme value analysis in spatio-temporal contexts. Focus on models that account for spatio-temporal dependence and inferences that provide appropriate uncertainty measures, with applications to real-world problems using open-source software.
Enrollment Requirements: Open to graduate students in Statistics, others with permission. Recommended Preparation: STAT 5405 or 5605 or GEOG 5600 or 5610 or ERTH 5150 or equivalent.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205845)

STAT 5915. Statistical Data Science in Action. (3 Credits)
Real-world statistical data science practice: problem formulation; integration of statistics, computing, and domain knowledge; collaboration; communication; reproducibility; project management.
Enrollment Requirements: STAT 5405 or instructor consent.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%205915)

STAT 6315. Statistical Inference I. (3 Credits)
Exponential families, sufficient statistics, loss function, decision rules, convexity, prior information, unbiasedness, Bayesian analysis, minimaxity, admissibility, simultaneous and shrinkage estimation, invariance, equivariant estimation.
Enrollment Requirements: Open to Ph.D. students who have passed the Ph.D. Qualifying Exam in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%206315)

STAT 6325. Advanced Probability. (3 Credits)
Fundamentals of measure and integration theory: fields, o-fields, and measures; extension of measures; Lebesgue-Stieltjes measures and distribution functions; measurable functions and integration theorems; the Radon-Nikodym Theorem, product measures, and Fubini's Theorem. Introduction to measure-theoretic probability: probability spaces and random variables; expectation and moments; independence, conditioning, the Borel-Cantelli Lemmas, and other topics as time allows.
Enrollment Requirements: Open to Ph.D. students who have passed the Ph.D. Qualifying Exam in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%206325)

STAT 6515. Statistical Inference II. (3 Credits)
Statistics and subfields, conditional expectations and probability distributions, uniformly most powerful tests, uniformly most powerful unbiased tests, confidence sets, conditional inference, robustness, change point problems, order restricted inference, asymptotics of likelihood ratio tests.
Enrollment Requirements: STAT 6315; open to Ph.D. students who have passed the Ph.D. Qualifying Exam in Statistics, others with permission.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%206515)

STAT 6615. Statistical Learning and Optimization. (3 Credits)
(Also offered as BIST 6615.) Computationally intensive statistical learning methods with optimization techniques: classification, discriminant analysis, (generalized) additive models, boosting, regression trees, regularized regression, principal components, support vector machines, and (deep) neural networks.
Enrollment Requirements: Instructor consent and intermediate courses in mathematical and applied statistics.
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%206615)

STAT 6894. Seminar in the Theory of Probability and Stochastic Processes. (1-6 Credits)
Enrollment Requirements: Open to graduate students in Statistics, others with permission.
May be repeated for a total of 12 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=STAT%206894)