

STATISTICS (STAT)

STAT 2013 Elementary Statistics (A)

Prerequisites: MATH 1483 or MATH 1513, each with a grade of "C" or better; or an acceptable placement score (see placement.okstate.edu).

Description: An introductory course in the theory and methods of statistics. Descriptive measures, elementary probability, sampling, estimation, hypothesis testing, correlation and regression. No degree credit for students with credit in STAT 2023 or STAT 2053.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

General Education and other Course Attributes: Analytical & Quant Thought

STAT 2023 Elementary Statistics for Business and Economics (A)

Prerequisites: MATH 1483 or MATH 1513, each with a grade of "C" or better; or an acceptable placement score (see placement.okstate.edu).

Description: Basic statistics course for undergraduate business majors. Descriptive statistics, basic probability, discrete and continuous distributions, point and interval estimation, hypothesis testing, correlation and simple linear regression. No degree credit for students with credit in STAT 2013 or STAT 2053.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

General Education and other Course Attributes: Analytical & Quant Thought

STAT 2053 Elementary Statistics for the Social Sciences (A)

Prerequisites: MATH 1483 or MATH 1513, each with a grade of "C" or better; or an acceptable placement score (see placement.okstate.edu).

Description: No credit for business majors. An introductory course in the theory and methods of statistics. Descriptive measures, elementary probability, sampling, estimation, hypothesis testing, correlation and regression. No degree credit for students with credit in STAT 2013 or 2023.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

General Education and other Course Attributes: Analytical & Quant Thought

STAT 2331 SAS Programming

Prerequisites: A different programming language or consent of instructor.

Description: SAS as a general purpose programming language, data representation, input/output, use of built-in procedures, report generation. Course previously offered as CS 2331.

Credit hours: 1

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 2890 Honors Experience in Statistics

Prerequisites: Honors Program participation and concurrent enrollment in a designated STAT course.

Description: A supplemental Honors experience in statistics to partner concurrently with designated statistics courses. This course adds a different intellectual dimension to the designated courses.

Credit hours: 1

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

General Education and other Course Attributes: Honors Credit

STAT 3013 Intermediate Statistical Analysis

Prerequisites: STAT 2013, STAT 2023 or STAT 2053.

Description: Applications of elementary statistics, introductory experimental design, introduction to the analysis of variance, simple and multiple linear regression, nonparametric statistics, survey sampling and time series. Data analysis using Excel included.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4013 Statistical Methods I (A)

Prerequisites: MATH 1513 with a grade of "C" or better; or an acceptable placement score (see placement.okstate.edu).

Description: Basic experimental statistics, basic probability distributions, methods of estimation, tests of significance, linear regression and correlation, analysis of variance for data that are in a one way, a two-way crossed, or in a two-fold nested classification. May not be used for degree credit with STAT 4053.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

General Education and other Course Attributes: Analytical & Quant Thought

STAT 4023 Statistical Methods II

Prerequisites: STAT 3013 or STAT 4013 or STAT 4033 or STAT 4053.

Description: Basic concepts of experimental design. Analysis of variance, covariance, split-plot design. Factorial arrangements of treatments, multiple regression in estimation and curvilinear regression, enumeration data. No degree credit for students with credit in 4063.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4033 Engineering Statistics

Prerequisites: MATH 2133 or MATH 2163.

Description: Probability, random variables, probability distributions, estimation, confidence intervals, hypothesis testing, linear regression. No degree credit for students with credit in STAT 4073.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4043 Applied Regression Analysis

Prerequisites: One of STAT 4013, STAT 4033, STAT 4053, STAT 5013 or equivalent.

Description: Matrix algebra, simple linear regression, residual analysis techniques, multiple regression, dummy variables.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4053 Statistical Methods I for the Social Sciences (A)

Prerequisites: MATH 1513 with a grade of "C" or better; or an acceptable placement score (see placement.okstate.edu).

Description: Basic experimental statistics, basic probability distributions, methods of estimation, tests of significance, linear regression, calculation and analysis of variance for one and two-way classifications. No degree credit for students with credit in STAT 4013.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

General Education and other Course Attributes: Analytical & Quant Thought

STAT 4063 Statistical Methods II for the Social Sciences

Prerequisites: STAT 3013 or STAT 4013 or STAT 4033 or STAT 4053.

Description: Basic concepts of experimental design. Analysis of variance, covariance, split-plot design. Factorial arrangements of treatments, multiple and curvilinear regression, enumeration data. No degree credit for students with credit in STAT 4023.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4073 Engineering Statistics with Design of Experiments

Prerequisites: MATH 2163.

Description: Random variables and basic probability distributions, estimation, confidence intervals, hypothesis testing, basic analysis of variance, factorial arrangement of treatments and fractional factorial experiments, elementary quality control. No degree credit for students with credit in STAT 4033.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4091 Sas Programming

Prerequisites: STAT 4013 or equivalent.

Description: SAS dataset construction, elementary statistical analysis, and use of statistics and graphics procedures available in SAS. No credit for students with credit in STAT 5091.

Credit hours: 1

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4191 R Programming

Prerequisites: STAT 4013 or equivalent.

Description: R dataset construction, elementary statistical analysis, and use of statistics and graphics with R. May not be used for degree credit with STAT 4193, STAT 5191, STAT 5193.

Credit hours: 1

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4193 SAS and R Programming

Prerequisites: STAT 4013 or equivalent.

Description: SAS and R dataset construction, elementary statistical analysis, and use of statistics and graphics with SAS and R. Students are required to complete the SAS Certified Base Programmer exam. Exam content, fees, and discount information is available at https://www.sas.com/en_us/certification.html#. May not be used for degree credit with STAT 4091, STAT 4191, STAT 5091, STAT 5191, STAT 5193.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4203 Mathematical Statistics I

Prerequisites: MATH 2163 with a grade of "C" or better.

Description: Introduction to probability theory for students who are not graduate majors in statistics or mathematics. Probability, dependence and independence, random variables, univariate distributions, multivariate distributions, moments, functions of random variables, moment generating functions.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4213 Mathematical Statistics II

Prerequisites: STAT 4203 and MATH 3013.

Description: Statistical inference for students who are not graduate majors in statistics or mathematics. Sampling distributions, maximum likelihood methods, point and interval estimation, hypothesis testing.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4463 Multivariate Methods

Prerequisites: STAT 4043 and (STAT 4023 or STAT 5023).

Description: Use of Hotelling's T-squared statistic, multivariate analysis of variance, canonical correlation, principal components, factor analysis and linear discriminate functions. No credit for students with credit in STAT 5063.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4910 Special Studies

Prerequisites: Consent of instructor.

Description: Special subjects in statistics. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.

Credit hours: 1-6

Contact hours: Other: 1

Levels: Graduate, Undergraduate

Schedule types: Independent Study

Department/School: Statistics

STAT 4981 Statistics Capstone I

Prerequisites: STAT 4023, STAT 4043, STAT 4091 and STAT 4203 or concurrent enrollment.

Description: Information and preparation for graduate school for statistics undergraduates, communication skills for collaborating with scientists, introduction to research in statistics.

Credit hours: 1

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4991 Statistics Capstone II

Prerequisites: STAT 4023, STAT 4043, STAT 4091, and STAT 4203 or concurrent enrollment.

Description: Career skills for statistics undergraduates entering the workforce, communication skills for collaborating with scientists.

Credit hours: 1

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Statistics

STAT 4993 Senior Honors Project

Prerequisites: Departmental invitation, senior standing, Honors Program participation.

Description: A guided reading and research program ending with an honors project under the direction of a faculty member, with a second faculty reader and an oral examination. Required for graduation with departmental honors in statistics.

Credit hours: 3

Contact hours: Other: 3

Levels: Undergraduate

Schedule types: Independent Study

Department/School: Statistics

General Education and other Course Attributes: Honors Credit

STAT 5000 Master's Research

Prerequisites: Consent of advisory committee.

Description: Methods of research and supervised thesis or report. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.

Credit hours: 1-6

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Statistics

STAT 5002 Applied Masters Creative Component

Prerequisites: Consent of advisory committee.

Description: Creative component for Applied Masters in Statistics.

Credit hours: 2

Contact hours: Other: 2

Levels: Graduate

Schedule types: Independent Study

Department/School: Statistics

STAT 5003 Statistics for Medical Residents

Prerequisites: Employed as a medical or veterinary resident or permission of instructor.

Description: Survey of statistical methodology relevant to health care professionals. Basic understanding of statistics presented in recent medical literature. Hypothesis testing, ANOVA techniques, regression, categorical techniques. Same course as BIOM 5003.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 5013 Statistics for Experimenters I

Prerequisites: Graduate standing and MATH 1513.

Description: Introductory statistics course for graduate students. Descriptive statistics, basic probability, estimation, hypothesis testing, p-values, analysis of variance, multiple comparisons, correlation and linear regression, categorical data analysis.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 5023 Statistics for Experimenters II

Prerequisites: Graduate standing and STAT 4023 or STAT 5013.

Description: Analysis of variance, contrasts and multiple comparisons, factorial experiments, variance components and their estimation, completely randomized, randomized block and Latin square designs, split plot experiments.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 5033 Nonparametric Methods

Prerequisites: One of STAT 4023, STAT 4043, STAT 5023 or consent of instructor.

Description: A continuation of STAT 4013 and STAT 4023, concentration on nonparametric methods. Alternatives to normal-theory statistical methods; analysis of categorical and ordinal data, methods based on rank transforms, measures of association, goodness of fit tests, order statistics.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 5043 Sample Survey Designs

Prerequisites: One of STAT 4013, STAT 4033, STAT 5013 or consent of instructor.

Description: Constructing and analyzing personal, telephone and mail surveys. Descriptive surveys including simple random, stratified random designs. Questionnaire design, frame construction, non-sampling errors, use of random number tables, sample size estimation and other topics related to practical conduct of surveys.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 5053 Time Series Analysis**Prerequisites:** STAT 4043.**Description:** An applied approach to the analysis of time series in the time domain. Trends, autocorrelation, random walk, seasonality, stationarity, autoregressive integrated moving average (ARIMA) processes, Box-Jenkins method, forecasting.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5063 Multivariate Methods****Prerequisites:** STAT 4043 and (STAT 4023 or STAT 5023).**Description:** Use of Hotelling's T-squared statistic, multivariate analysis of variance, canonical correlation, principal components, factor analysis and linear discriminate functions. No degree credit for students with credit in STAT 4463.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5073 Categorical Data Analysis****Prerequisites:** STAT 5223, STAT 5023 or equivalent or concurrent enrollment.**Description:** Analysis of data involving variables of a categorical nature. Contingency tables, exact tests, binary response models, loglinear models, analyses involving ordinal variables, multinomial response models. Computer usage for analysis is discussed.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5083 Statistics for Biomedical Researchers****Prerequisites:** STAT 5013.**Description:** Analysis of variance, experimental designs pertaining to medical research, regression and data modeling, categorical techniques and the evaluation of diagnostic tests. No credit for students with credit in STAT 5023.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5091 Sas Programming****Prerequisites:** STAT 5013 or equivalent.**Description:** SAS dataset construction, elementary statistical analysis, and use of statistics and graphics procedures available in SAS. No credit for students with credit in STAT 4091.**Credit hours:** 1**Contact hours:** Lecture: 1**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5093 Statistical Computing****Prerequisites:** STAT 5123 or STAT 4203, STAT 5013 or equivalent, CS 1113 or equivalent.**Description:** Random variable generation; numerical calculations of maximum likelihood estimators, quasi-likelihood estimators, probabilities, and quantiles; computer intensive exact tests and distributions; randomized tests; bootstrap and jack knife methods, Monte Carlo simulations Markov Chain Monte Carlo methods for Bayesian estimation.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5123 Probability Theory****Prerequisites:** MATH 2163 and one other course in MATH that has either MATH 2144 or MATH 2153 as a prerequisite.**Description:** Basic probability theory, random events, dependence and independence, random variables, moments, distributions of functions of random variables, weak laws of large numbers, central limit theorems.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5133 Stochastic Processes****Prerequisites:** STAT 5123 and MATH 2233, MATH 3013.**Description:** Definition of a stochastic process, probability structure, mean and covariance function, the set of sample functions, stationary processes and their spectral analyses, renewal processes, counting processes, discrete and continuous Markov chains, birth and death processes, exponential model, queuing theory. Same course as IEM 5133 & MATH 5133.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5191 R Programming****Prerequisites:** STAT 4013 or equivalent.**Description:** R dataset construction, elementary statistical analysis, and use of statistics and graphics with R. May not be used for degree credit with STAT 4191, STAT 4193, STAT 5193.**Credit hours:** 1**Contact hours:** Lecture: 1**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5193 SAS and R Programming****Prerequisites:** STAT 5013 or equivalent.**Description:** SAS and R dataset construction, elementary statistical analysis, and use of statistics and graphics with SAS and R. Students are required to complete the SAS Certified Base Programmer exam. Exam content, fees, and discount information is available at https://www.sas.com/en_us/certification.html#. May not be used for degree credit with STAT 4091, STAT 4191, STAT 4193, STAT 5191, STAT 5091.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics

STAT 5213 Bayesian Analysis**Prerequisites:** STAT 5223 or consent of instructor.**Description:** Fundamentals of Bayesian inference, Bayesian hierarchical models, choices of priors, Markov chain Monte Carlo, model checking and comparison, advanced topics and applications.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5223 Statistical Inference****Prerequisites:** STAT 5123 and MATH 3013.**Description:** Sampling distributions, point estimation, maximum likelihood methods, Rao-Cramer inequality, confidence intervals, hypothesis testing, sufficiency, completeness. Previously offered as STAT 4223.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5303 Experimental Designs****Prerequisites:** STAT 5023 or STAT 4023 with consent of instructor.**Description:** Review of basic concepts, interpretation of main effects and interactions in multi- factor designs, multiple comparisons, split-unit experiments, complete and incomplete block designs, linear mixed models analysis (including repeated measures analysis), 2n and 3n factorial experiments, fractional factorial experiments, crossover designs.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5323 Theory of Linear Models I****Prerequisites:** STAT 5223, MATH 3013, and one of STAT 4023 or STAT 5023.**Description:** Matrix theory (generalized inverse, idempotent matrix, and non- negative matrix results), multivariate normal distribution, quadratic forms, chi-square distribution, general linear models, estimability, general hypothesis testing.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5333 Theory of Linear Models II****Prerequisites:** STAT 5323.**Description:** Maximum likelihood estimation; one- way and two-way ANOVA models, multiple comparisons, regression models, linear mixed models, variance component estimation.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5513 Multivariate Analysis****Prerequisites:** STAT 5323.**Description:** Multivariate normal distribution, simple, partial and multiple correlation, multivariate sampling distributions. Wishart distribution, general T-distribution, estimation of parameters and tests of hypotheses on vector means and covariance matrix. Classification problems, discriminate analysis, and applications.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 5910 Seminar in Statistics****Prerequisites:** Consent of instructor.**Description:** Investigation of special problems in the theory and/or application of statistics using current techniques. Special studies for M.S. level students. Offered for variable credit, 1-6 credits. maximum of 3 credit hours.**Credit hours:** 1-6**Contact hours:** Other: 1**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Statistics**STAT 6000 Doctoral Dissertation****Prerequisites:** Consent of advisory committee.**Description:** Directed research culminating in the PhD thesis. Offered for variable credit, 1-10 credit hours, maximum of 30 credit hours.**Credit hours:** 1-10**Contact hours:** Other: 1**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Statistics**STAT 6010 Statistics Literature****Prerequisites:** Consent of instructor.**Description:** Published journal articles from statistics or related areas are discussed. Previously offered as STAT 6001.**Credit hours:** 1**Contact hours:** Lecture: 1**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics**STAT 6013 Genetic Statistics****Prerequisites:** A one-year graduate level sequence in statistics or with the permission of the instructor.**Description:** Course provides a statistical basis for modeling genetic evolution in populations and describing variation in quantitative traits. Population genetics principles will be used to study DNA sequence variation and quantitative traits.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Statistics

STAT 6113 Probability Theory

Prerequisites: STAT 5123 and MATH 5143.

Description: Measure theoretical presentation of probability, integration and expectation, product spaces and independence, conditioning, different kinds of convergence in probability theory, statistical spaces, characteristic functions and their applications. Previously offered as STAT 5113.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 6203 Large Sample Inference

Prerequisites: STAT 5223 and STAT 6113.

Description: Different types of convergence in probability theory, central limit theorem, consistency, large sample estimation and tests of hypotheses, concepts of asymptotic efficiency, nonparametric tests. Previously offered as STAT 5203.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 6223 Advanced Statistical Inference

Prerequisites: STAT 6113.

Description: Point estimation, maximum likelihood, Cramer-Rao inequality, confidence intervals, Neyman-Pearson theory of testing hypothesis and power of test. Previously offered as STAT 6213.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Statistics

STAT 6910 Special Problems

Prerequisites: Consent of instructor.

Description: Investigation of special problems in the theory and application of statistics using current techniques. Special studies for PhD level students. Offered for variable credit, 1-6 credit hours, maximum of 12 credit hours.

Credit hours: 1-12

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Statistics