DEPARTMENT OF STATISTICS

The science of statistics deals with the collection and summarization of data, design of experiments and surveys, measurement of the magnitude of variation in both experimental and survey data, estimation of population parameters with measures of their accuracy and precision, tests of hypotheses about populations and studies of the relationships between two or more variables. While the ideal of science is to achieve a systematic interrelationship of facts, scientific methods must be a pursuit of this ideal by experimentation, observation and logical arguments from various accepted postulates. Thus, the science of statistics is a set of scientific principles and methodologies that are useful in reaching conclusions about populations and processes when the available information is both limited and variable. Hence, statistical principles are useful in all the sciences, both physical and social. Many practical applications of statistics are found in a wide variety of fields, including biology, education, social sciences, engineering, business, government and agriculture.

The Department of Statistics offers training in statistics leading to degrees of Bachelor of Science, Master of Science and Doctor of Philosophy.

Faculty

Akleman, Derya G, Instructional Associate Professor
Statistics
PHD, Texas A&M University, 1996

Bhattacharya, Anirban, Assistant Professor
Statistics
PHD, Duke University, 2012

Carroll, Raymond J, Distinguished Professor
Statistics
PHD, Purdue University, 1974

Chen, Willa W, Professor
Statistics
PHD, New York University, 2000

Cline, Daren B, Professor
Statistics
PHD, Colorado State University, 1983

Dabney, Alan R, Associate Professor
Statistics
PHD, University of Washington, 2006

Gaynanova, Irina, Assistant Professor
Statistics
PHD, Cornell University, 2015

Hart, Jeffrey D, Professor
Statistics
PHD, Southern Methodist University, 1981

Hatfield, Lloyd K, Senior Lecturer
Statistics
MBA, University of North Texas, 1980

Hernandez Magallanes, Irma Del Consue, Visiting Assistant Professor
Statistics
PHD, University California Berkley, 2010

Huang, Jianhua, Professor
Statistics
PHD, University of California, Berkeley, 1997

Johnson, Valen E, Distinguished Professor
Statistics
PHD, University Of Chicago, 1989

Jones, Edward R, Executive Professor
Statistics
PHD, Virginia Tech, 1976

Jun, Mikyoung, Associate Professor
Statistics
PHD, University of Chicago, 2005

Katzfuss, Matthias S, Assistant Professor
Statistics
PHD, The Ohio State University, 2011

Kincheloe, Faron, Visiting Professor
Statistics
MS, Baylor University, 2011

Kolodziej, Elizabeth Y, Instructional Assistant Professor
Statistics
PHD, Texas A&M University, 2010

Liang, Hwa Chi, Instructional Assistant Professor
Statistics
PHD, University of New Mexico, 2003

Long, James P, Assistant Professor
Statistics
PHD, University of California - Berkeley, 2013

Longnecker, Michael T, Professor
Statistics
PHD, Florida State University, 1976

Mallick, Bani K, Distinguished Professor
Statistics
PHD, University of Connecticut, 1994

Mueller-Harknett, Ursula U, Professor
Statistics
PHD, Universitat Bremen, Germany, 1997

Newton, Howard J, Senior Professor
Statistics
PHD, SUNY Buffalo, 1975

Pati, Debdeep, Associate Professor
Statistics
PHD, Duke University, 2012

Pourahmadi, Mohsen, Professor
Statistics
PHD, Michigan State University, 1980

Sang, Huiyan, Associate Professor
Statistics
PHD, Duke University, 2008

Schmiediche, Henrik, Instructional Associate Professor
Statistics
PHD, Texas A&M University, 1993

Sheather, Simon J, Professor
Statistics
PHD, La Trobe University, 1986

Sinha, Samiran, Professor
Statistics
PHD, University of Florida, 2004

Spiegelman, Clifford H, Distinguished Professor
Statistics
PHD, Northwestern University, 1976

Subbarao, Suhasini T, Professor
Statistics
PHD, University of Bristol, 2001

Wang, Suojin, Professor
Statistics
PHD, University of Texas at Austin, 1988

Wehrly, Thomas E, Senior Professor
Statistics
PHD, University of Wisconsin - Madison, 1976

Wong, Ka Wai, Assistant Professor
Statistics
PHD, University California, Davis, 2014

Zhang, Xianyang, Assistant Professor
Statistics
PHD, University of Illinois at Urbana - Champaign, 2013

Zhou, Lan, Associate Professor
Statistics
PHD, University of California, Berkeley, 1997

Majors

- Bachelor of Science in Statistics (http://catalog.tamu.edu/undergraduate/science/statistics/bs)

Minors

- Minor in Statistics (http://catalog.tamu.edu/undergraduate/science/statistics/minor)

Courses

STAT 182 Foundations of Statistics
Credit 1. 1 Lecture Hour.
Elementary topics in statistics; data collection; design of experiments; confidence intervals, hypothesis testing; ethics in statistics; the role of statistics in industry, the health profession and the sciences.
Prerequisite: Statistics majors only.

STAT 201 Elementary Statistical Inference
Credits 3. 3 Lecture Hours.
(MATH 1342, 1442) Elementary Statistical Inference. Data collection, tabulation and presentation; elementary description of the tools of statistical inference; probability, sampling and hypothesis testing; applications of statistical techniques to practical problems. May not be taken for credit after or concurrently with any other course in statistics or SCMT 303.

STAT 211 Principles of Statistics I
Credits 3. 3 Lecture Hours.
Introduction to probability and probability distributions; sampling and descriptive measures; inference and hypothesis testing; linear regression, analysis of variance.
Prerequisite: MATH 152 or MATH 172.

STAT 212 Principles of Statistics II
Credits 3. 3 Lecture Hours.
Design of experiments, model building, multiple regression, nonparametric techniques and contingency tables.
Prerequisite: STAT 211.

STAT 301 Introduction to Biometry
Credits 3. 3 Lecture Hours.
Intended for students in animal sciences. Introduces fundamental concepts of biometry including measures of location and variation, probability, tests of significance, regression, correlation and analysis of variance which are used in advanced courses and are being widely applied to animal-oriented industry. Only one of the following will satisfy the requirements for a degree: STAT 301, STAT 302 or STAT 303.
Prerequisite: MATH 141 or MATH 166 or equivalent; junior or senior classification.

STAT 302 Statistical Methods
Credits 3. 3 Lecture Hours.
Intended for undergraduates in the biological sciences. Introduction to concepts of random sampling and statistical inference; estimation and testing hypotheses of means and variances; analysis of variance; regression analysis; chi-square tests. Only one of the following will satisfy the requirements for a degree: STAT 301, STAT 302 or STAT 303.
Prerequisite: MATH 141 or MATH 166 or equivalent; junior or senior classification.

STAT 303 Statistical Methods
Credits 3. 3 Lecture Hours.
Intended for undergraduates in the social sciences. Introduction to concepts of random sampling and statistical inference, estimation and testing hypotheses of means and variances, analysis of variance, regression analysis, chi-square tests. Only one of the following will satisfy the requirements for a degree: STAT 301, STAT 302 or STAT 303.
Prerequisite: MATH 141 or MATH 166 or equivalent; junior or senior classification.

STAT 307 Sample Survey Techniques
Credits 3. 3 Lecture Hours.
Concepts of population and sample; the organization of a sample survey; questionnaire design. Basic survey designs and computation of estimates and variances.
Prerequisite: STAT 301 or STAT 302 or STAT 303 or SCMT 303.

STAT 404 Statistical Computing
Credits 3. 3 Lecture Hours.
Statistical programming in R and SAS; random number generation; design of simulation studies; interactive and dynamic statistical graphics; parallel computing in statistics.
Prerequisites: STAT 212; junior or senior classification or approval of instructor.

STAT 406 Design and Analysis of Experiments
Credits 3. 3 Lecture Hours.
Design fundamentals; completely randomized designs; blocking; factorial, nested, nested-factorial designs; incomplete designs; fractional factorial designs; confounding; general mixed factorials; split pilot; analysis of covariance; crossover designs; power analysis, sample size determination.
Prerequisite: STAT 212; STAT 408.

STAT 407 Principles of Sample Surveys
Credits 3. 3 Lecture Hours.
Principles of sample surveys and survey design; techniques for variance reduction; simple, stratified and multi-stage sampling; ratio and regression estimates; post-stratification; equal and unequal probability sampling.
Prerequisite: STAT 212.

STAT 408 Introduction to Linear Models
Credits 3. 3 Lecture Hours.
Introduction to the formulation of linear models and the estimation of the parameters of such models, with primary emphasis on least squares. Application to multiple regression and curve fitting.
Prerequisites: STAT 212; MATH 304 or MATH 323.

STAT 414 Mathematical Statistics I
Credits 3. 3 Lecture Hours.
Mathematical theory of statistics; probability, random variables and their distributions, transformations of random variables, expectations and variance, generating functions, sampling distributions and basic limit theorems.
Prerequisite: MATH 221, MATH 251 or MATH 253.

STAT 415 Mathematical Statistics II
Credits 3. 3 Lecture Hours.
Continuation of the mathematical theory of statistics, including principles for statistical inference, formulation of statistical models, reduction of data, point estimation, confidence intervals, hypothesis testing and Bayesian inference.
Prerequisite: STAT 414 or MATH 411.

STAT 426 Methods in Time Series Analysis
Credits 3. 3 Lecture Hours.
Autocorrelation and spectral characteristics of univariate, autoregressive and moving average models; identification, estimation and forecasting.
Prerequisites: STAT 408; STAT 414 or approval of instructor.

STAT 436 Multivariate Analysis and Statistical Learning
Credits 3. 3 Lecture Hours.
Matrix algebra; random vectors; multivariate distributions; copulas; multivariate generalizations of classical testing; principle component analysis; discriminant analysis; clustering; multidimensional scaling; factor analysis; canonical analysis.
Prerequisites: MATH 304 or MATH 323; STAT 212; STAT 415 or equivalent.

STAT 438 Bayesian Statistics
Credits 3. 3 Lecture Hours.
Analysis of scalar and vector-valued parameters; Bayesian linear models; Monte Carlo computational methods; prior elicitation; hypothesis testing and model selection; hierarchical models; selected advanced models; use of statistical packages such as WinBUGS, R or MATLAB.
Prerequisites: MATH 221; STAT 408 or equivalent.

STAT 445 Applied Biostatistics and Data Analysis
Credits 3. 3 Lecture Hours.
Applications of regression methods in biostatistics; correlated data analysis; survival analysis; missing data techniques; use of the R programming language.
Prerequisites: STAT 212; STAT 408 or approval of instructor.

STAT 446 Statistical Bioinformatics
Credits 3. 3 Lecture Hours.
Analysis of high-dimensional genomic and proteomic data using R; sequence analysis; genome-wide association studies; proteomics; array-based technologies; classification techniques.
Prerequisites: STAT 212; STAT 408 or approval of instructor.

STAT 459 Categorical Data Analysis
Credits 3. 3 Lecture Hours.
Techniques for the analysis of categorical data; contingency table analysis; logistic regression; Poisson regression; loglinear models; analysis of ordinal data; use of computer software such as SAS or R.
Prerequisite: STAT 212; STAT 408 or equivalent.

STAT 482 Statistics Capstone
Credits 3. 3 Lecture Hours.
Integration of statistical models, design, sampling, graphics and computing for the analysis of real problems; planning, drafting, revising and editing reports; ethics; principles of collaboration and communication.
Prerequisites: STAT 404; STAT 406; STAT 408 and senior classification.

STAT 485 Directed Studies
Credits 1 to 6. 1 to 6 Other Hours.
Special problems in statistics not covered by another course in the curriculum. Work may be in either theory or methodology.
Prerequisite: Approval of instructor.

STAT 489 Special Topics in…
Credits 1 to 4. 1 to 4 Lecture Hours.
Selected topics in an identified area of statistics. May be repeated for credit.
Prerequisite: Junior or senior classification or approval of department head.

STAT 491 Research
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.
Research conducted under the direction of faculty members in statistics. May be taken four times for credit. Registration in multiple sections of this course is possible within a given semester provided that the per semester credit hour limit is not exceeded.
Prerequisite: Junior or senior classification or approval of instructor.