BS/MS Integrated Program

Statistics is a scientific discipline by which statisticians assist other scientists and researchers in making informed decisions in the face of uncertainty. Statisticians use skills in a variety of areas to solve problems. The application of statistics is the embodiment of the scientific method.

The Master of Science in Statistics is an applied statistics degree that prepares outstanding students for successful and productive careers. The graduate curriculum is designed to equip students with decision-making skills necessary for successful careers as professional statisticians. Although a firm foundation in theoretical statistics is provided, most of the courses are applied in nature, offering approaches to the solution of important real-world problems.

Twenty to twenty-five students are currently enrolled in the master's program in statistics. Full-time students should complete the master's program in two years.

100% Post graduation Placement *

66% Employment at:
Zions Bank
Monsanto Co.
Pacific Northwest National Laboratory
Overtock.com
Edison Media Research
U of U School of Medicine
LDS Church
The RBL Group
Watson Wyatt
Coventry Healthcare
Intel
Adobe

34% Pursue Doctoral Degree at
Duke
Texas A&M
UNC-Chapel Hill
North Carolina State
U.C. Santa Cruz
The Ohio State
Virginia Tech
University of Arizona
University of Nebraska
University of Michigan

*last three years

Admission Requirements

Applicants must have a bachelor's degree from an accredited US university or equivalent, with a minimum 3.3 undergraduate GPA. We also require two methods courses beyond introductory statistics, a calculus-based statistical theory course, differential, integral, and multivariate calculus courses, and a linear algebra course. You must have a B- or higher in each course. A math minor is recommended.

To Apply

Application forms are available online at http://statistics.byu.edu/content/integrated-bsms-statistics-program. All applications must be submitted before the February 1 deadline for Fall admission, and students must agree to live according to BYU standards of personal conduct as stated in the Honor Code.

Profile of Admitted Students Fall 2017

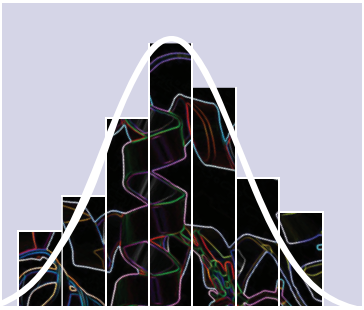
MEAN GPA: 3.90
MEAN GRE: V - 160, Q -164, W - 4.0

Masters Degree Requirements

- Thesis or Project
  - o Thesis Option (33): minimum 27 coursework hours plus 6 thesis hours (Stat 699R
  - o Project Option (33): minimum 30 coursework hours plus 3 project hours (Stat 698R)
- Required courses: Stat 535, 536, 537, 624, 637, 641, 642, 651, and 666.
- Comprehensive written examination covering Stat 535, 624, 641, 642
- C+ or better in each class with a cumulative 3.0 GPA in all MS degree classes

Financial Assistance

The department has limited funds to supplement students' financial resources. All admitted students receive teaching or research assistantships. Some students will receive full-tuition awards.



223 TMCB · Provo, UT 84602-1044 · (801) 422-4506 · Fax (801) 422-0635 · graduate@stat.byu.edu

Required Courses

STAT 535 Applied Linear Models
Analysis of full-rank, model, over-parameterized model, cell means model, unequal subclass frequencies, and missing and fused cells. Estimability issues, diagnostics.

STAT 624 Statistical Computation
Fundamental numerical methods used by statisticians, programming concepts, efficient useo f software available for statisticians, simulation studies.

STAT 641 Probability Theory & Mathematical Statistics 1
Axioms of probability; combinatorics; random variables, densities and distributions; expectation; independence; joint distributions; conditional probability; inequalities; derived random variables; generating functions; limit theorems; convergence results.

STAT 642 Probability Theory & Mathematical Statistics 2
Introduction to statistical theory, principles of sufficiency and likelihood; point and interval estimation, maximum likelihood, Bayesian inference, hypothesis testing, Neyman-Pearson lemma, likelihood ratio tests, asymptotic results including delta method, exponential family

Graduate Electives:

STAT 531 Experimental Design

Basic designs, power and sample size, Latin squares, incomplete blocks, change-over designs, factorials, fractional factorials, confounding, split-plots, response surface designs.STAT 536 Statistical Learning and Data Mining

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Weighted least squares, robust regression, regularization, dimension reduction, nonlinear regression, local regression, generalized additive models, Gaussian process regression, tree-structured regression, support vector machines, classification.

STAT 537 Mixed Model Methods
Fixed effects, random effects, repeated measures; non-independent data, general covariance structures, estimation methods.

STAT 538 Survival Analysis
Basic concepts of survival analysis, hazard functions, types of censoring, Kaplan-Meier estimates, Logrank tests, proportional hazard models, examples drawn from clinical and epidemiological literature.

STAT 631 Advanced Experimental Design
Response surface methods; mixture designs; optimal designs; fractions of two-level, three level, and mixed-level factorials; analysis of experiments with complex aliasing; robust parameter designs.

STAT 637 Generalized Linear Models
Generalized linear models framework, binary data, polytomous data, log-linear models.

STAT 651 Bayesian Methods
Basic Bayesian inference, conjugate and non-conjugate analyses, Markov Chain Monte Carlo Methods, hierarchical modeling, convergence diagnostics.

STAT 666 Multivariate Statistical Methods
Inference about mean vectors and covariance matrices, multivariate analysis of variance and regression, canonical correlation, discriminate analysis, cluster analysis, principal component analysis, factor analysis.

While not required, we recommend these undergraduate courses to expand your career opportunities:

STAT 124, 224 SAS programming
STAT 435 Nonparametric Statistical Methods
STAT 462 Quality Control and Industrial Statistics
STAT 466 Introduction to Reliability

Department Research Interests

Research emphases include Bayesian methods, environmental and spatial statistics, reliability of industrial and computing processes, statistical genetics and bioinformatics, mixed models and longitudinal data, data mining, chemometrics, actuarial methods, design and analysis of experiments, and statistical computation. In addition to these general areas, more specific research interest for individual faculty are listed on their web pages

Berrett, Candace, Assistant professor. PhD, Ohio State University, 2010. Spatial and Space-time Statistics; Bayesian Modeling, Categorical Data, Applications to the Environmental Sciences

Blades, Natalie J., Associate Professor. PhD, Johns Hopkins University, 2003. Infectious Disease Epidemiology; Ordinal Data Models

Christensen, William F., Professor. PhD, Iowa State University, 1999. Environmental and Spatial Statistics; Multivariate Analysis, Pollution Source Apportionment;; Climate and Paleoclimate; Applications of Statistics in Politics and Law

Dahl, David B., Professor. PhD university of Wisconsin-Madison, 2004. Bayesian non-parametrics: model-based clustering; random partition models; protein structure prediction, bioinformatics; and statistical computing

Engler, David A., Associate Professor. PhD, Harvard University, 2007. Model Assessment in High-Dimensional Data Settings; Time Series, Applications in Finance and Environmental Science

Fellingham, Gilbert W., Professor. PhD, University of Washington, 1990. Bayesian Nonparametrics; Bayesian Hierarchical Models; Applications in Sports, Human Performance, and Health

Grimshaw, Scott D., Professor. PhD, Texas A&M University, 1989. Data Science; Process Monitoring

Hartman, Brian M.., Assistant Professor. PhD, Texas A&M University, 2012. Bayesian methods and their applications in actuarial science and risk; Storm damage prediction for electric utilities; Healthcare claims severity modeling; Loss reserving

Heaton, Matthew J., Assistant professor. PhD, Duke University, 2011. Spatio-temoral Statistics, Environmental Impacts, Unvertainty Quantification, Statistics in Epidemiology, Bayesian Modeling.

Lawson, John S., Professor. PhD, Polytechnic Institute of New York, 1984. Design and Analysis of Experiments; Reliability Engineering; Statistical Process Control

Page, Garritt L., Assistant Professor, PhD Iowa State University, 2009. (Non) Parametric Bayesian Methods; Hierarchical Modeling; Spatial Statistics Mixtures; Statistics in Sports; Statistics in Education

Reese, C. Shane., Professor. PhD, Texas A & M University, 1999. Bayesian Hierarchical Models; Bayesian Optimal Experimental Design; Sports Statistics; Reliability; Computer Experiments; Applications of Statistics to National Security Issues; Environmental Statistics

Richardson, Robert A. Assistant Professor, PhD, University of California, Santa Cruz 2015. Spatio-temporal data analysis; Bayesian non-parametrics; Stochastic differential equations; Actuarial and financial models

Scott, Del T, Professor, PhD, Pennsylvania State University, 1977. Statistical Computing; Categorical Data Analysis; Linear Models; Graphical Analysis.

Tass, E. Shannon., Associate Professor, PhD Rice University, 2008. Biostatistics; Statistical Application in Medicine, Health, and Wildlife; Spatial Statistics and Climate

Tolley, H. Dennis., Professor. PhD, University of North Carolina, 1974.Actuarial methods in Health, Statistical Methods in Analytic Chemistry

Warr, Richard L., Assistant Professor. PhD, University of New Mexico, 2010. Nonparametric Bayesian Statistics, Stochastic Processe, Reliability.

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