Statistics

Department Chair: Dr. Rhonda Magel
Department Location: Morril Hall
Email: ndsu.stats@ndsu.edu
Telephone Number: (701) 231-7177
Degrees Offered: Ph.D., M.S., Certificate
Application Deadline: Application deadline is March 15 for international students and applicants who would like an opportunity for an assistantship if available.
Test Requirements: GRE (recommended)
English Proficiency TOEFL ibT 79
Requirements: IELTS 6.5

Program Description

The Department of Statistics offers programs leading to a Ph.D. in statistics or a master's degree in applied statistics. The program is flexible enough to be individually planned around prior experience and in accord with professional goals.

During the first year of the program, students are strongly encouraged to meet with each faculty member to discuss possible research topics. The student should select an advisory and examining committee by the end of the first year.

A joint master's degree in computer science and statistics may also be obtained. A graduate certificate in Applied Statistics for non majors is also offered.

Admissions Requirements

Graduate Certificate

- B.S. or equivalent degree from an accredited university,
- Knowledge of College Algebra

Master's Program in Applied Statistics

The Department of Statistics' graduate program is open to qualified graduates of universities of recognized standing. In addition to the Graduate School requirements (http://bulletin.ndsu.edu/past-bulletin-archive/2014-15/graduate/admission-information) , the applicant must:

- Have had at least one year of calculus,
- Have had at least one course in statistics,
- Have had at least one programming language and

Joint Master's Program in Computer Science and Statistics

To be admitted with full status into the M.S. program in computer science and statistics, the applicant must satisfy the admission requirements for both the M.S. program in computer science and the M.S. program in applied statistics.

Ph.D. Program in Statistics

In addition to the Graduate School requirements (http://bulletin.ndsu.edu/past-bulletin-archive/2014-15/graduate/admission-information) , the applicant must:

- Have had four courses in math at the university calculus level or above,
- Have had several courses in statistics,
- Have had at least one programming language

Students not holding a master's degree in statistics or a closely related field will not be admitted to the Ph.D. program in statistics. These students must first apply to the M.S. program in applied statistics and complete the M.S. degree.

Ph.D. Program in Statistics (with Emphasis in Sports Statistics)

In addition to the Graduate School requirements (http://bulletin.ndsu.edu/past-bulletin-archive/2014-15/graduate/admission-information) , the applicant must:

- Have had four courses in math at the university calculus level or above.
- Have had several courses in statistics.
- Have had a least one programming language.

Students entering program with this option can be admitted directly into the Ph.D. program after receiving B.S. degree. Students holding M.S. degree may also apply.

Financial Assistance

Teaching assistantships are available. To be considered for an assistantship, the application must be complete with the Graduate School no later than March 15.

Graduate Certificate

Requires 12 Semester credit hours consisting of STAT 725 Applied Statistics, STAT 726 Applied Regression and Analysis of Variance, and two other pre-approved graduate level courses in statistics. After completing the requirements for the certificate, please contact the Department of Statistics to verify completion.

M.S. Degree in Applied Statistics

The program for the M.S. degree in applied statistics requires 32 semester credits with an overall GPA of 3.0 or higher. An oral defense of a research-based thesis or paper is required. The program for the M.S. degree in computer science and statistics requires 42 semester credits with an overall GPA of 3.0 or higher. An oral defense of a research-based thesis or paper is required.

All students must:

1. **Complete a set of core courses with a grade of B or better, including**

STAT 661	Applied Regression Models	3
STAT 662	Introduction to Experimental Design	3
STAT 767	Probability and Mathematical Statistics I	3
STAT 768	Probability and Mathematical Statistics II	3
STAT 764	Multivariate Methods	3
or STAT 774	Linear Models I	
Successfully complete 2 one-credit practicums in consulting. Each statistical practicum will be listed as STAT 794		2

Complete an additional 9-12 hours (depends on number of research hours) of course work selected from the following courses:		9-12
STAT 650	Stochastic Processes	
STAT 651		
STAT 660	Applied Survey Sampling	
STAT 663	Nonparametric Statistics	
STAT 664	Discrete Data Analysis	
STAT 665	Meta-Analysis Methods	
STAT 670	Statistical SAS Programming	
STAT 671	Introduction to the R Language	
STAT 672	Time Series	
STAT 673	Actuarial Statistical Risk Analysis	
STAT 677	Introductory Survival and Risk Analysis I	
STAT 678	Introductory Survival and Risk Analysis II	
STAT 730	Biostatistics	
STAT 732	Introduction to Bioinformatics	
STAT 761	Advanced Regression	
STAT 762	Messy Data Analysis	
STAT 770	Survival Analysis	
STAT 775	Using Statistics in Sports	
STAT 777	Multivariate Theory	
STAT 778	Modern Probability Theory	
STAT 780	Asymptotics, Bootstrap, and Other Resampling Plans	
STAT 786	Advanced Inference	
STAT 796	Special Topics	
Pass two written comprehensive exams. Exam 1 covers STAT 767 and STAT 768. Exam 2 covers STAT 661, STAT 662, and STAT 764 or STAT 774. Exam 1 is two hours and Exam 2 is three hours. These exams are offered during approximately the fourth week of Fall and Spring Semesters. A maximum of two attempts will be allowed.		
STAT 798	Master's Thesis	1-10
or STAT 797	Master's Paper	
Must have 15 hours of 700-789 level courses.		

M.S. Degree in Computer Science and Statistics

All students must :

1. Take a minimum of 42 semester credit hours, including at least 18 graduate course credits in computer science and at least 18 graduate course credits in statistics,
2. Take CSCI 808 Foundations of Programming, CSCI 713 Software Development Processes, CSCI 724 Survey of Artificial Intelligence, CSCI 737 System Simulation, CSCI 765 Introduction To Database Systems and one additional 600- or 700-level course in computer science,
3. Take STAT 661 Applied Regression Models, STAT 662 Introduction to Experimental Design, STAT 767 Probability and Mathematical Statistics I, STAT 768 Probability and Mathematical Statistics II, STAT 764 Multivariate Methods or STAT 774 Linear Models I, and one additional 600- or 700-level course in statistics (does not include

STAT 725 Applied Statistics or STAT 726 Applied Regression and Analysis of Variance),
4. Pass both the comprehensive exams for the M.S. degree in computer science and the M.S. degree in statistics, and
5. Successfully complete a research-based thesis or paper. The supervisory committee must consist of at least one faculty member from computer science and at least one faculty member from statistics.

Ph.D. Degree in Statistics [*]

The program for the Ph.D. degree requires an additional 30 credits of course work beyond the M.S. degree and 30 hours of research. An oral defense of a dissertation is required. All students must:

Complete a set of core courses with a grade of B or better, including

STAT 661	Applied Regression Models	3
STAT 662	Introduction to Experimental Design	3
STAT 767	Probability and Mathematical Statistics I	3
STAT 768	Probability and Mathematical Statistics II	3
STAT 764	Multivariate Methods	3
or STAT 774	Linear Models I	
Successfully complete 6 one-credit practicums in Consulting/ Presentation Practicum. Each statistical practicum will be listed as STAT 794 Practicum/Internship		
Complete an additional 30 semester credits of statistics courses at the 600- or 700-level (does not include STAT 725 Applied Statistics or STAT 726 Applied Regression and Analysis of Variance). At least 15 credits must be at the 700-level. All Ph.D. students must complete STAT 786 Advanced Inference,		

Complete 9 semester credits from the following

This requirement may be waived and additional courses in statistics substituted upon approval by the adviser and advisory committee.		
MATH 650	Real Analysis I	
MATH 651	Real Analysis II	
MATH 688	Numerical Analysis I	
MATH 689	Numerical Analysis II	
MATH 725 Linear Algebra		
CSCI 654	Operations Research	
CSCI 737	System Simulation	

- A plan of study must be submitted
- Pass a written comprehensive exam. This exam consists of two sections. It is given twice a year during approximately the fifth week of each Semester. A maximum of two attempts is allowed,
- Submit a research proposal and pass an oral exam on the proposal and related topics, and
- Complete and successfully defend the research dissertation.

[*] Some of these requirements may be satisfied upon admittance into the program with an already existing M.S. degree in Statistics.

Ph.D. in Statistics (with Emphasis in Sports Statistics)

This program does require 41 credits in course work, 6 credits in an internship, 3 credits in seminars, and 30 credits in research beyond the B.S. degree. Students in this program must:

1.

STAT 661	Applied Regression Models	3
STAT 662	Introduction to Experimental Design	3
STAT 767	Probability and Mathematical Statistics I	3
STAT 768	Probability and Mathematical Statistics II	3
STAT 764	Multivariate Methods	3
or STAT 774	Linear Models I	
Complete 6 additional courses including:		
STAT 650	Stochastic Processes	3
STAT 651		3
STAT 663	Nonparametric Statistics	3
STAT 664	Discrete Data Analysis	3
STAT 671	Introduction to the R Language	3
STAT 775	Using Statistics in Sports	3

Complete 15 credits of electives in graduate statistics courses (These could include STAT 660, STAT 670, STAT 672, STAT 761, STAT 772, among others).

Successfully complete 3 one-credit seminars in sports statistics, STAT 790 Graduate Seminar.

Successfully complete an internship with a sports team for two seasons (a student could also work with two different sports teams - one for each season) – STAT 794 Practicum/Internship (6 credits)

Pass a written comprehensive exam. This exam consists of two sections over the set of core courses and is given twice per year. A maximum of two attempts is allowed.

Submit a research proposal in the area of sports statistics and pass an oral exam on the proposal and related topics

Complete and successfully defend the dissertation in sports statistics.

Note: A student may also enter this program after receiving an M.S. degree is Statistics or closely related field. Previously taken courses will be evaluated to determine their fit into this program.

Ron Degges, Ph.D.
North Dakota State University, 2011
Field: Sampling, Regression Analysis

Seung Won Hyun, Ph.D.
University of Missouri, 2010
Field: Optimal Designs, Adaptive Designs, Clinical Trials

Rhonda Magel, Ph.D.
University of Missouri-Rolla, 1982
Field: Nonparametrics, Inference Under Order Restrictions, Regression

Megan Orr, Ph.D.
Iowa State University, 2012
Field: Biostatistics, Gene Expression Analysis, High-Dimensional Data, Analysis and Multiple Testing

Gang Shen, Ph.D.
Purdue University, 2009
Field: Mathematical Statistics, Asymptotic Theory, Bayesian Analysis, Change-Point Problem

Yarong Yang, Ph.D.
Northern Illinois University, 2010
Field: Machine Learning, Spatial Statistics, Bayesian Statistics, Bioinformatics