

# Statistics

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## Department Information

- **Department Web Site:**  
www.ndsu.edu/statistics/ (<http://www.ndsu.edu/statistics/>)
- **Credential Offered:**  
B.S.; B.A.; Minor
- **Official Program Curriculum:**  
[catalog.ndsu.edu/undergraduate/program-curriculum/statistics/](http://catalog.ndsu.edu/undergraduate/program-curriculum/statistics/) (<http://catalog.ndsu.edu/undergraduate/program-curriculum/statistics/>)

Today, most professional statistical training is received at the undergraduate, as well as at the graduate level. A major in statistics and a minor in any of the other related areas, such as mathematics, computer science, agriculture, biological sciences or social sciences provide a good blend of training suitable for many jobs in industry, government and academic institutions. It is becoming increasingly important for those in other disciplines to have good familiarity with basic statistical techniques and inference procedures.

## The Program

The Department of Statistics offers a major leading to bachelor's, master's and doctoral degrees. Two undergraduate minors are offered, one in applied statistics and the second in statistics. Graduate certificates in Statistics and Big Data Applied Statistical Analysis are also available. A mathematics and statistics double major, the pre-actuarial science option and a degree in behavioral statistics are offered at the undergraduate level.

The department provides opportunities to study both applied and theoretical aspects of statistics. Computers are extensively used in statistics instruction, and statistical software packages and programs are utilized in various courses. Data analysis is an important aspect in applied statistics courses.

## Career Opportunities

There are excellent opportunities in statistics. Major corporations and most government agencies continually look for talented individuals with this type of education. Since even greater job opportunities are open to those with advanced statistical training, many undergraduates proceed directly to graduate work in statistics. Many students combine statistics with areas such as business, education, economics or biology.

Career opportunities are varied. A statistician may:

- consult in the design and analysis of clinical studies, evaluating new pharmaceutical agents;
- design experiments for agricultural, ecological, environmental or energy-related studies;
- determine mortality, morbidity and accident rates for an insurance company;
- serve as an opinion pollster for a public relations firm or a television network;
- develop theories of learning and behavior in conjunction with psychologists;
- determine optimal combinations and evaluate performance of various chemicals in industrial setups;
- conduct reliability and quality control studies in various industries; or
- develop econometrics, time series and forecasting models for determining the cause and effects of various socio-economic variables on society.

Statisticians work closely with other scientists and researchers to develop new statistical techniques, adapt existing techniques, design experiments and direct analyses of surveys and retrospective studies.

Statisticians are ranked number one in best STEM jobs in 2022 according to U.S. News and World Report.

## The Facilities

The campus has several computer clusters connected to the campus network and the Internet. SAS, SPSS, Minitab, JMP, and R are among the statistical packages available. Computer consultants are available to assist students if programming help is needed.

## Statistics Curriculum

For a statistics major, 15 to 18 credits in mathematics, four to seven credits in computer science and 21 to 27 credits in statistics are required. A minor in one of the following areas is also required: social science, physical science, biological sciences, business, mathematics or computer science.

Students interested in biostatistics may minor in biological sciences.

A student interested in business statistics may minor in business administration.

## Pre-Actuarial Option

A joint degree with mathematics with a pre-actuarial science option is also available.

## Behavioral Statistics Requirements

The behavioral statistics degree is a joint effort between the Department of Statistics and the Department of Psychology. Students wishing to obtain a degree in behavioral statistics should consult with an advisor in both departments. Employment opportunities include working with medical or Medicare data. Graduates of this program are expected to have good quantitative reasoning skills and strong people skills.

## The Faculty

Rhonda C. Magel, Ph.D., Professor, Chair, University of Missouri, 1982; Field: Nonparametrics, Inference Under Order Restrictions, Regression

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

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

Ronald Degges, Ph.D., Associate Professor of Practice, North Dakota State University, 2011; Field: Survival Analysis, Nonparametrics and Regression

Bong-Jin Choi, Ph.D., Assistant Professor, University of South Florida, 2014; Field: Computational Statistics, Machine Learning, Biostatistics, Public Health Research, Big Data Analysis

Mingao Yuan, Ph.D., Assistant Professor, Purdue University, 2018; Field: Network Analysis, Big Data Analysis, Statistical Machine Learning

Andrew Lexvold, M.S., Lecturer, North Dakota State University, 2016; Field: Biostatistics, Bayesian and Spatial Analyses Applied to Election Forecasting

## Sample Program Guide

**IMPORTANT DISCLAIMER:** A Sample Program Guide provides an unofficial guide of program requirements and should be used by prospective students who are considering attending NDSU in the future. It is NOT an official curriculum and should NOT be used by current NDSU students for official degree planning purposes. Note that the official curriculum used by current NDSU students can vary from the Sample Program Guide due to a variety of factors such as, but not limited to, start year, education goals, transfer credit, and course availability.

To ensure proper program completion, enrolled students should utilize Degree Map (<https://www.ndsu.edu/registrar/degreemap/>) and Schedule Planner (<https://www.ndsu.edu/onestop/degree-map-and-planning/>) in Campus Connection and consult regularly with their academic advisor to ensure requirements are being met.

| Freshman  |         |   |           |
|---|---------|---|-----------|
| Fall  | Credits | Spring  | Credits   |
| ENGL 110  |         | 3 ENGL 120  | 3         |
| COMM 110  |         | 3 MATH 129  | 3         |
| MATH 165  |         | 4 MATH 166  | 4         |
| STAT 330  |         | 3 CSCI 114  | 3         |
| Wellness Gen Ed   |         | 2 Social & Behavioral Sciences Gen Ed (Global Perspectives or Cultural Diversity) | 3         |
|   |         | <b>15</b>   | <b>16</b> |
| Sophomore   |         |   |           |
| Fall  | Credits | Spring  | Credits   |
| STAT 367  |         | 3 STAT 368  | 3         |
| STAT 461  |         | 3 CSCI 160  | 4         |
| MATH 265  |         | 4 Minor Requirement   | 3         |
| Humanities & Fine Arts Gen Ed (Global Perspectives or Cultural Diversity) |         | 3 Humanities and Fine Arts Gen Ed   | 3         |
| Science and Tech Gen Ed w/Lab   |         | 4 Science and Technology Gen Ed   | 3         |
|   |         | <b>17</b>   | <b>16</b> |

| <b>Junior</b>                         |                |                                     |                |
|---------------------------------------|----------------|-------------------------------------|----------------|
| <b>Fall</b>                           | <b>Credits</b> | <b>Spring</b>                       | <b>Credits</b> |
| Statistics Elective                   |                | 6 STAT Elective                     | 3              |
| Minor Requirement                     |                | 3 Minor Requirement                 | 3              |
| Social and Behavioral Sciences Gen Ed |                | 3 Upper Division Writing Gen Ed     | 3              |
| CSCI 222 or MATH 270                  |                | 3 Humanities/Social Sciences Gen Ed | 3              |
|                                       |                | <b>15</b>                           | <b>12</b>      |

| <b>Senior</b>                     |                |                     |                |
|-----------------------------------|----------------|---------------------|----------------|
| <b>Fall</b>                       | <b>Credits</b> | <b>Spring</b>       | <b>Credits</b> |
| STAT Elective                     |                | 3 STAT 462          | 3              |
| Minor Requirement                 |                | 3 STAT Elective     | 3              |
| Humanities/Social Sciences Gen Ed |                | 3 Minor Requirement | 4              |
| Electives                         |                | 6 Electives         | 4-6            |
|                                   |                | <b>15</b>           | <b>14</b>      |

**Total Credits: 120**