

# Master of Science in Applied Statistics and Decision Analytics



## Learning Objectives

Building on the recommendations of the American Statistical Association (ASA)'s professional panel of experts, graduates of the M.S. in Applied Statistics and Decision Analytics program at Western Illinois University will be able to:

1. Apply advanced statistical methodologies; derive and understand basic theory underlying these methodologies; and formulate and model practical problems for solutions using these methodologies
2. Produce relevant computer output using necessary and sufficient programming skills and standard statistical software (e.g., SAS, R, STATA, etc.) and interpret the results appropriately
3. Communicate statistical concepts and analytical results clearly and appropriately
4. Identify areas where ethical issues may arise in statistics

## Program Description

The Master of Science (M.S.) in Applied Statistics and Decision Analytics at Western Illinois University is a multidisciplinary graduate degree program with a unique focus. The M.S. degree in Applied Statistics and Decision Analytics is a 30-semester-hour (SH) curriculum designed to provide students with a firm foundation of statistical analysis and modeling commonly used in many fields, including education, science, technology, health care, government, business or social science research. Students in this program will be trained on industry-standard software packages and gain modern analytical skills. The need for skilled data professionals is growing. According to a study by the McKinsey Global Institute, the United States could face a shortage of as many as 190,000 workers with “deep analytical skills” by 2018. This program seeks to combine the course work of statistical decision making and analytic tools to meet the demand for skilled workers in the U.S. and Illinois job markets. With three Fortune 100 companies in the region—John Deere, Caterpillar and State Farm—this degree program is designed to address strong regional needs and/or a shortage of graduates in the fields of applied statistics and decision analytics.

## Career Opportunities

Companies hiring include Caterpillar, John Deere, Hewlett-Packard, Honeywell, Northrop Grumman, Boeing, the American Medical Association, the Chicago Board of Trade, U.S. Treasury, U.S. Comptroller of the Currency, the Tennessee Department of Commerce, Principal Financial Group, Bank of America, Merrill Lynch, Exxon, Illinois Power, Newsweek and Walmart.

## Why WIU?

- Large enough to offer a wide variety of courses, yet small enough to provide individual attention
- Faculty members are interested in students' intellectual development
- Advising tailored to students' personal needs and educational goals
- Opportunities for interacting with students from other cultures and countries
- Academic credit for internships and assistance in locating internships
- Career development and employment information provided regularly
- Success in preparing students for admission to Ph.D. programs
- Opportunities to learn technical and quantitative skills highly sought after in the job market

## Admission Requirements

For admission to the Master of Science in Applied Statistics and Decision Analytics degree program, students should have at least a 3.0 cumulative GPA and undergraduate preparation in a relevant area, such as mathematics, statistics, economics, quantitative or biological sciences, sociology, psychology, business, computer sciences, physics, engineering or education. Applicants for admission to the Master of Science degree program in Applied Statistics and Decision Analytics must satisfy the standards for admission to WIU School of Graduate Studies.

Application for admission to the School of Graduate Studies must be made online at [wiu.edu/grad/](http://wiu.edu/grad/) apply. Applicants must hold a bachelor's degree from an institution accredited by the appropriate

## Program Location:

Macomb

## Contact Information

### Questions about the program:

Department of Economics and Decision Sciences

Jessica Lin, graduate committee chair  
(309) 298-1153

[JL-Lin@wiu.edu](mailto:JL-Lin@wiu.edu) or  
[decisionanalytics@wiu.edu](mailto:decisionanalytics@wiu.edu)

### General admission questions:

School of Graduate Studies  
(309) 298-1806 or (877) WIU GRAD  
[Grad-Office@wiu.edu](mailto:Grad-Office@wiu.edu)  
[wiu.edu/grad](http://wiu.edu/grad)

## Higher Values in Higher Education

Academic Excellence  
Educational Opportunity  
Personal Growth  
Social Responsibility



**WESTERN  
ILLINOIS  
UNIVERSITY**

U.S. Department of Education regional accrediting agency. Applicants are required to provide proof of such degree by submitting an official degree transcript for each college or university previously attended directly to the WIU School of Graduate Studies. Transcripts on file in the Office of the Registrar at WIU will be obtained by Graduate School personnel.

Admission to any graduate degree program at WIU is contingent upon successful completion of undergraduate coursework specified as a prerequisite. If an applicant is deficient in any or all of the minimum requirements for admission into program, such an applicant may be provisionally admitted subject to the completion of all deficiencies before taking any required courses within the program. The applicants will be duly notified what deficiency courses they need to take at Western before they will be allowed to enroll in any of the required courses.

All applicants should have at least a 3.0 cumulative GPA, the deficiency courses that an applicant may be asked to complete include one year of calculus (Math 133/134 or Math 137/138), Introduction to Probability & Statistics (STAT 276/DS 303/DS 503) or equivalent. Students deficient in any of these areas will be required to take one or more courses to remove these deficiencies prior to enrolling in the courses that are part of the program's core requirements. Students that do not meet the 3.0 GPA requirement are encouraged to take the GRE and submit the results to strengthen their respective application in the program. Students who wish to apply for an assistantship are also required to provide at least three letters of reference from individuals who can provide meaningful comments on the student's professional and/or academic background and a statement of interest (not to exceed two pages in length).

Students whose language is other than English must demonstrate written and spoken English language proficiency. Evaluation of English language proficiency will be based on the student's score on the Test of English as a Foreign Language (TOEFL). Students must meet institutionally-mandated TOEFL scores as established by the WIU Center for International Studies.

## Degree Requirements

The total program hours are 30 semester hours (30 SH).

### I. Core Courses

Eighteen semester hours (18 SH) of core courses include: Applied Data Mining and Business Decision Making (DS 435G), Statistical Software for Data Management and Decision Making (DS 490G), Data Visualization for Analytics (DS 521), Management Science Techniques and Business Analytics (DS 523), Categorical Data Analysis Using Logistic Regression (DS 560) and Predictive Analytics and Time Series Forecasting (DS 580).

### II. Directed Electives

Six hours of semester hours (6 SH) of either graduate level DS coursework, or the following courses may be used: Econometrics (ECON 506), Structural Equation Modeling for Behavioral Sciences (PSY 551), Introduction to Mathematical Statistics (STAT 471G), Analysis of Variance (STATE 478G) or Applied Statistical Methods (STAT 533).

### III. Capstone

There are three options for completing the remaining six semester hours (6 SH): (1) Thesis Option (DS 601) for six hours; (2) Internship Option (DS 599) for six hours; or (3) Capstone Project Option (ECON 507 and one additional elective from II) for a total of six hours.



Students must also successfully complete two semesters of Department Seminar (DS 602) for zero credit hours, and the Applied Statistics and Decision Analytics Assessment (DS 604) for zero credit hours.

## STEM Designation

The MS in Applied Statistics and Decision Analytics program has been designated by the U.S. Immigration and Customs Enforcement Agency within the U.S. Department of Homeland Security as a STEM-eligible degree program (CIP code 27.0501). The STEM designation allows eligible graduates on student visas access to an Optional Practical Training (OPT) extension, up to 36 months, as compared to 12 months for non-STEM degrees. As an international student, the longer work authorization term may help gain additional real-world skills and experience in the U.S.

## Faculty Expertise

Faculty members in the WIU Department of Economics and Decision Sciences take an active and sincere interest in student success. Our faculty are also active in research, so students learn state-of-the-art skills and techniques. All faculty teaching graduate courses have PhDs in Economics or Statistics.

## Post-Baccalaureate Certificate Program

The WIU Department of Economics and Decision Sciences also offers an 18 SH post-baccalaureate certificate (PBC) in Business Analytics. The PBC offers the technical skills of data mining, statistical modeling, and forecasting for data-driven decision-making and for solving the analytical problems of the contemporary business world. Students in the MS program can readily complete the certificate at the same time as their MS degree without extending their degree time.

## Campus Visits

The department welcomes visitors. To arrange a visit, call the WIU Department of Economics and Decision Sciences chair at (309) 298-1153 or e-mail [decisionanalytics@wiu.edu](mailto:decisionanalytics@wiu.edu). Learn more about the department by visiting [wiu.edu/eds](http://wiu.edu/eds).