

College of Business

**Operations Management & Information Systems
(OM&IS) Department**

M.S. in Data Analytics

M.S. Degree-Assessment Plan

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1. Introduction

The M.S. program in data analytics (MSDA) provides students the advanced knowledge and skills to analyze organizational data. The program prepares students for data-driven leadership and problem solving. Graduates of the MSDA will be data-driven thinkers to approach business decision-making more rigorously and confidently, while effectively communicating data findings, interpreting complex data, and guiding their organizations in making more informed and actionable strategic decisions.

The proposed MSDA program is in an online format for a large population of potential graduate students who cannot commit to either a full-time or location-based program to obtain the advanced degree. The program consists of two phases. Phase One (6 semester hours) is designed to address deficiencies in undergraduate course work considered to be prerequisite for the Phase Two (30 semester hours) graduate course work. Students with significant undergraduate coursework in business may be waived from some, or all, of the Phase One requirements. Exemption exams are also available to waive Phase One requirements. Phase Two consists of 10 courses to ensure an in-depth study in data analytics.

2. Student Learning Outcomes (SLOs)

Graduates from the NIU Department of Operations Management and Information Systems' Master of Science in Data Analytics program will fulfill the following learning outcomes.

Learning Outcome 1: Demonstrate Data-Driven Problem Solving and Decision Making Skills

1.1 Demonstrate how analyzing data can improve decisions throughout an organization's value chain.

1.2 Research and evaluate emerging technologies and data analytics trends in order to develop innovative data-driven organizational strategies and solutions.

Learning Outcome 2: Demonstrate the Ability to Access, Collect, Integrate, and Analyze Data in Order to Solve Business Problems

2.1 Differentiate different forms of analytics and the methods used in each.

2.2 Prepare data for statistical analysis.

2.3 Use analytical tools and software widely used in practice.

2.4 Perform basic exploratory and descriptive analysis, as well as predictive and prescriptive analyses.

2.5 Explain complex analytical models.

Learning Outcome 3: Demonstrate Business Communication and Presentation Skills

3.1 Effectively present results using data visualization tools.

3.2 Communicate and present complex analytics results to business clients, using practical and simple business terms that can be understood by general non-technical audiences.

Learning Outcome 4: Demonstrate Project Management and Critical Thinking Skills

4.1 Manage a data analytics project to interpret complex data and to guide their organizations in making more informed and actionable decisions.

4.2 Analyze critical factors leading to the identification of a business problem or opportunity. This may also lead to smarter business moves, more efficient operations, higher profits, and happier customers.

3. Program- by-Baccalaureate Student Learning Outcome Matrix

N/A.

This is a master program.

4. Curriculum Map

Table 1: Program Student Learning Outcomes for MSDA Courses
(Estimate level of coverage: B=beginning; D=developing; P=proficient level;)

| MSDA Course Assessment | | | | | | | | | | | |
|-------------------------------|--|--|--------------------------------|--------------------------|-----------------------------------|---|-----------------------------|------------------------------|-----------------------------|------------------------|------------------------------|
| | 1.1 Improve Decisions for Organizational Value Chain | 1.2 Research and Evaluate Emerging DA Technologies | 2.1 Methods for Data Analytics | 2.2 Statistical Analysis | 2.3 Analytical Tools and Software | 2.4 Descriptive and Predictive Analysis | 2.5 Data Analytics Modeling | 3.1 Information Presentation | 3.2 Business Communications | 4.1 Project Management | 4.2 Critical Thinking Skills |
| OMIS 628 | P | D | D | D | D | D | D | | | | D |
| OMIS 645 | | D | D | P | | P | | | | | |
| OMIS 649 | | | | | P | | D | | D | | D |
| OMIS 652 | | D | | | D | | D | D | D | | D |
| OMIS 661 | | D | P | | P | | P | | D | D | |
| OMIS 665 | | D | | D | P | | P | P | | | P |
| OMIS 673 | | | | | | | | P | P | | D |
| OMIS 681 | | D | | | | P | P | | | | |
| OMIS 683 | | | P | | P | | P | | | | P |
| OMIS 690 | P | D | | | | | D | | | P | D |

5. Assessment Methods

The M.S. in Data Analytics program is assessed on four major learning goals through (1) course performance assessment, (2) exit survey of graduates, (3) alumni survey, (4) faculty review of student learning in the curriculum, and (5) Executive Advisory Council review of student learning in the curriculum. As seen below, the Department utilizes multiple methods and multiple courses to gather information related to the M.S. in Data Analytics program assessment.

The Department has its own assessment committee. In addition, a faculty member is designated as the Assessment Coordinator for the Department. This individual works closely with the chair to plan, implement, and report assessment activity. With the creation of the College of Business Graduate Curriculum Committee, we now have additional faculty to work closely with the chair on the MSDA program assessment.

Explanation of Assessment Methods

Table 2 outlines the learning outcomes, the department assessment methods, the timing, and the responsible person for each assessment effort.

Table 2: M.S. in Data Analytics Program Assessment Methods

| Learning Outcomes | Method | Timeline | Person Responsible |
|---|----------------------------|-----------------|---------------------------|
| Data Driven Problem Solving & Decision Making Skills | Course Embedded Measures | Every year | Course Instructor |
| | Exit Survey of Graduates | Every semester | Academic Advisor |
| | Alumni Survey | Every 2 years | Academic Advisor |
| | Faculty Review | Every 2 years | Chair/faculty members |
| | Executive Advisory Council | Every 2 years | Chair |
| Ability to Access, Collect, Integrate, and Analyze Data | Course Embedded Measures | Every year | Capstone Instructor |
| | Exit Survey of Graduates | Every semester | Academic Advisor |
| | Alumni Survey | Every 2 years | Academic Advisor |
| | Faculty Review | Every 2 years | Chair/faculty members |
| | Executive Advisory Council | Every 2 years | Chair |
| Business Communication | Course Embedded Measures | Every year | Course Instructor |
| | Exit Survey of Graduates | Every semester | Academic Advisor |

| | | | |
|--|---|---|---|
| & Presentation skills | Alumni Survey Faculty Review Executive Advisory Council | Every 2 years Every 2 years Every 2 years | Academic Advisor Chair/faculty members Chair |
| Project Management & Critical Thinking Skills | Course Embedded Measures Exit Survey of Graduates Alumni Survey Faculty Review Executive Advisory Council | Every year Every semester Every 2 years Every 2 years Every 2 years | Course Instructor Academic Advisor Academic Advisor Chair/faculty members Chair |

A description of each assessment method is given below:

- (1) Course Embedded Measures: All M.S. Data Analytics faculty and instructors in the Department will be required to submit a course template for each course they taught to specify how the course learning objectives contribute to the program learning objectives and outcomes. The assessment committee will work with each M.S. in Data Analytics faculty to identify the learning outcomes to be assessed in each as shown in Table 1 above. The Department chair and assessment coordinator then write a letter to selected M.S. in Data Analytics course instructors on learning objectives and timeline to complete the necessary assessment. All course assessment used a standard form to complete the course assessment. Target: 80% of each class students will meet or exceed expectations on each learning objectives.

- (2) Exit Survey of Graduates: An exit survey is conducted by the academic advisor every semester for graduating M.S. in Data Analytics students. The exit survey will be completed through Qualtrics. Each learning outcome is measured on a 5 point Likert scale with 5 equating to superior preparation provided by the department. Target: 80% of graduating MSDA students will rate the learning objective as a 4 or higher. Types of data on the survey include:
 - Job placement
 - Salary
 - Graduate appraisal of job preparedness
 - Overall satisfaction with the program
 - Quality of the program
 - Program strengths and weaknesses
 - Effectiveness of the curriculum in various topic areas
 - Continuing education

- (3) Alumni Survey: The NIU Office of Assessment Services will send M.S. in MSDA graduates a survey one, five and nine years post-graduation. The Department will also conduct its own alumni survey. The survey includes questions about the M.S. in Data Analytics program and alumni perceptions of the Department in terms of its effectiveness in its teaching and each of the learning outcomes. Each learning outcome is rated on a 5 point Likert scale with 5 equating to superior preparation provided by the Department. Target: 80% of alumni surveyed will rate the learning objectives as a 4.0 (good) or higher.
- (4) Faculty Review: Feedback from Department faculty and instructors are also used to review student learning outcomes. The curriculum and assessment committees meet every month during a regular semester. All faculty and instructors will complete and return a survey which includes questions rating the Department in its effectiveness in preparing graduates of the respective programs in terms of each of the learning outcomes every two years. Each learning outcome is rated on a 5 point Likert scale with 5 equating to superior preparation provided by the department. Target: 80% of faculty/instructor will rate each of the learning objectives as 4.0 (good) or higher.
- (5) Executive Advisory Council (EAC): This council, made up of faculty, alumni, and business professionals from the disciplines of operations management and information systems, meets on campus twice a year to advise the Department on programs, curricular, job placement, and assessment issues. Feedback from EAC business members is used to assess student learning outcomes. Every two years, all EAC business members are been asked to complete and return a survey which includes questions rating the department in its effectiveness in preparing graduates of the respective programs in terms of each of the learning outcomes. Each learning outcome is rated on a 5 point Likert scale with 5 equating to superior preparation provided by the department. Target: 80% of the EAC members will rate each of the learning objectives as 4.0 (good) or higher.

Table 3: Assessment Method Explanation

| Assessment Method | Explanation | | | | | |
|--------------------------|---|---|---|-----------------------------|---|---------|
| | Description | Student-Level Achievement | Program-Level Target | When Data Will be Collected | Person Responsible | SLOs |
| Course Embedded Measures | Faculty assess student achievement of an assigned learning objective through course embedded measures. Faculty submit an assessment form reporting results. | A student will receive a percentage score for the learning outcomes measured. | 80% of each class students will meet or exceed expectations on the assessed learning objectives | Every year | Instructor; Chair; Assessment Coordinator | 1,2,3,4 |
| Exit Survey of Graduates | All graduating MSDA students are required to fill out an exit survey through Qualtrics on measuring SLOs. | Self-evaluate ratings on the learning objectives. | The average rating by students on each of the learning objectives evaluated will be 4.0 (good) or higher. | Every semester | Academic advisor | 1,2,3,4 |
| Alumni Survey | Survey alumni in Department's effectiveness in preparing students in terms of each of the learning outcomes. | n/a | The average rating by alumni on each of the learning objectives evaluated will be 4.0 (good) or higher. | Every 2 years | Chair & Assessment coordinator | 1,2,3,4 |
| Faculty Review | All faculty and instructors will be asked to complete and return a survey which includes questions rating the department in its effectiveness | n/a | The average rating by faculty members on each of the learning objectives evaluated | Every 2years | Chair & faculty members | 1,2,3,4 |

| | | | | | | |
|------------|--|-----|--|---------------|-------|---------|
| | in preparing graduates of the respective programs in terms of each of the learning outcomes every two years. | | will be 4.0 (good) or higher. | | | |
| EAC Review | All board members will be asked to complete and return a survey which includes questions rating the Department in its effectiveness in preparing graduates of the respective programs in terms of each of the learning outcomes every two years. | n/a | The average rating by faculty members on each of the learning objectives evaluated will be 4.0 (good) or higher. | Every 2 years | Chair | 1,2,3,4 |

Table 4: Assessment Methods by Outcome Matrix

| Assessment Method | Explanation | | | |
|--------------------------|--|---|--|---|
| | Data Driven Problem Solving & Decision Making Skills | Ability to Access, Collect, Integrate, and Analyze Data | Business Communication & Presentation skills | Project Management & Critical Thinking Skills |
| Course Embedded Measures | <u>F, D</u> | <u>F, D</u> | <u>F, D</u> | <u>F, D</u> |
| Exit Survey | <u>F, I</u> | <u>F, I</u> | <u>F, I</u> | <u>F, I</u> |
| Alumni Survey | <u>S, I</u> | <u>S, I</u> | <u>S, I</u> | <u>S, I</u> |
| Faculty Review | <u>S, I</u> | <u>S, I</u> | <u>S, I</u> | <u>S, I</u> |
| EAC Review | <u>S, I</u> | <u>S, I</u> | <u>S, I</u> | <u>S, I</u> |

Note: F=formative assessment; S=summative assessment; D=directive assessment; and I=indirective assessment.