

# Texas State University

## Outcomes Report

### General Information

Academic Year:	2020-2021
College:	Business
Department:	CIS & Quantitative Methods
Program:	Data Analytics and Information Systems
Program Code:	52.13
Outcome Type:	Student Learning (GR)
Degree:	Masters
Coordinator/Contact:	Jaymeen Shah
Status:	Entry Meets Minimum Requirements

### Mission Statement

The Master of Science in Data Analytics and Information Systems (MSDAIS) program is a flexible, part-time program focused on preparing students for successful careers in data analytics related professions. The MSDAIS program emphasizes data analytics, information technology, and technical skills required for careers in data analytics.

### Evidence of Improvement

Not Applicable as AY 2020-2021 is the first year of assessment reporting for the MSDAIS program learning outcomes, no data exists for a comparative performance analysis. This year's assessment results will serve as the baseline results.

### Action Plan

In AY 2020-2021, the components listed below of Learning Outcomes 1, 3, 4, and 5 missed the 80% target of exceeding or meeting the expectations. Action plan for these learning outcomes is given below.

**(1) Learning Outcome #1** - Students will demonstrate critical thinking skills necessary to define and solve problems.

Method 2:

QMST 5334 - Statistical Methods for Business.

(a) Additional reading material emphasizing successful factors in defining real-world problems will be included.

**(2) Learning Outcome #3** - Ability to analyze large datasets and develop modeling solutions to support decision making.

Method 2:

QMST 5336 - Analytics.

(a) Provide more practice exercises and case studies to enhance ability to make data-driven decisions using analytical results from data.

**(3) Learning Outcome #4** - Apply knowledge and technical skills to perform prescriptive analytics.

Method 1:

QMST 5336 - Analytics.

(a) Provide additional out-of-class practice exercises to enhance students' comprehension of the use of optimization and decision analysis for a given scenario.

(b) Revise the lecture content to make it easier for students to comprehend optimization and decision analysis concepts and methods.

**(4) Learning Outcome #5** - Design and implement data management strategies.

Method 2:

CIS 5355 - Database Management Systems.

(a) Provide additional practice exercises for using SQL to implement relational database schedule for given business scenario.

(b) Devote more time in class to explain concepts and do in-class exercises for writing SQL statements to generate required information and for implementing database schema.

Additional details of specific action plans to assist students meet the learning outcomes established for the MSDAIS program are provided in the results section.

### Outcome 1

**Category:** Student Learning Outcome

**Students will demonstrate critical thinking skills necessary to define and solve problems.**

The **standards** of performance for the methods below are:

- Scores of 90% correct or better will indicate that the student exceeds expectations
- Scores greater than 80% correct but less than 90% correct will indicate that the student meets expectations
- Scores less than 80% correct will indicate that the student failed to meet expectations.

It is **expected** that 80% of students enrolled in the course during the academic year will meet or exceed the standards on each learning outcome.

### Outcome 1 - Method 1

**1A. In QMST 5334, Statistical Methods for Business, the assessment technique/rubric for outcome 1 is as follows.** Short-answer items in exams will be used to assess students' ability to define problems and apply appropriate statistical techniques. Excellent scores will have correct use

of statistical techniques and interpretation of results. Acceptable scores will have some errors in technique used or interpretation of results. Unacceptable scores will have major errors in use of techniques and interpretation of results.

**1B. In CIS 5357, Computing for Data Analytics, the assessment technique/rubric for outcome 1 is as follows.** An exam problem will require students to define problem and develop code to implement solution for the given problem. Excellent scores will have correctly implemented the solution for the given problem. Acceptable scores will have some error in the code implementation. Unacceptable scores will have major errors and the code may not work for the problem.

**Outcome 1 - Method 1 - Result**

**SUMMARY STATISTICS FOR OUTCOME #1 IN QMST 5334 - Statistical Methods for Business FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Define problems	Exceeds	71	60.2%	30	60.0%	101	60.1%
	Meets	31	26.3%	12	24.0%	43	25.6%
	Failed to meet	16	13.5%	8	16.0%	24	14.3%
	<b>Total</b>	<b>118</b>	<b>100%</b>	<b>50</b>	<b>100%</b>	<b>168</b>	<b>100%</b>
Apply appropriate statistical techniques	Exceeds	74	62.7%	17	34%	91	54.2%
	Meets	33	28.0%	23	46%	56	33.3%
	Failed to meet	11	9.3%	10	20%	21	12.5%
	<b>Total</b>	<b>118</b>	<b>100%</b>	<b>50</b>	<b>100%</b>	<b>168</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for defining problems: 85.7%

Percentage of MSDAIS students who met or exceeded expectations for applying appropriate statistical techniques: 87.5%

Explanation of Results: In QMST 5334 - Statistical Methods for Business, more than 80% of the MSDAIS students met or exceeded the standards for defining problems and applying appropriate statistical techniques for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #1 for the year. It is positive that more than 80% of the MSDAIS students successfully defined problems and realized the use of appropriate statistical techniques to solve real-world business problems.

**SUMMARY STATISTICS FOR OUTCOME #1 IN CIS 5357 - Computing for Data Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Define problem	Exceeds	29	76.32	9	47.37	38	66.67
	Meets	3	7.89	6	31.58	9	15.79
	Failed to meet	6	15.79	4	21.05	10	17.54
	<b>Total</b>	<b>38</b>	<b>100.00</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.00</b>
Develop code to implement solution for the given problem	Exceeds	29	76.32	9	47.37	38	66.67
	Meets	3	7.89	6	31.58	9	15.79
	Failed to meet	6	15.79	4	21.05	10	17.54
	<b>Total</b>	<b>38</b>	<b>100.00</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.00</b>

Percentage of MSDAIS students who met or exceeded expectations for defining problems: 82.5%

Percentage of MSDAIS students who met or exceeded expectations for developing code to implement solution for the given problem: 82.5%

Explanation of Results: In CIS 5357 - Computing for Data Analytics, more than 80% of the MSDAIS students met or exceeded the standards for defining problems and developing code to implement solution for the given problem for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #1 for the year. It is positive that more than 80% of the MSDAIS students successfully defined problems and developed code to implement solution for the given problems. Students' performance indicates that they are able to master concepts but have some difficulty in both defining the problem and then developing the code to implement solution within time constraints of an examination.

Action Plan:

1. For QMST 5334 - Statistical Methods for Business: Additional reading material emphasizing successful factors in defining real-world problems will be included.
2. For CIS 5357 - Computing for Data Analytics: (a) Use out-of-class video series explaining Python concepts. (b) Adopt a textbook that has adequate coverage of advanced concepts discussed in class.

**Outcome 1 - Method 2**

**2A. In QMST 5334, Statistical Methods for Business, the assessment technique/rubric for outcome 1 is as follows.** A project that will require students to define problem and use appropriate technique(s) to solve the problem. Excellent scores will have correct use of statistical techniques and interpretation of results. Acceptable scores will have some errors in technique used or interpretation of results. Unacceptable scores will have major errors in use of techniques and interpretation of results.

**2B. In CIS 5357, Computing for Data Analytics, the assessment technique/rubric for outcome 1 is as follows.** An out-of-class assignment will require students to define problem and develop code to implement solution for the problem. Excellent scores will have implemented the solution for the given problem. Acceptable scores will have some error in the code implementation. Unacceptable scores will have major errors and the code may not work for the problem.

**Outcome 1 - Method 2 - Result**

**SUMMARY STATISTICS FOR OUTCOME #1 IN QMST 5334 - Statistical Methods for Business FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
<b>Define problem</b>	Exceeds	71	60.2%	31	62.0%	102	60.7%
	Meets	18	15.2%	13	26.0%	31	18.4%
	Failed to meet	29	24.6%	6	12.0%	35	20.8%
	<b>Total</b>	<b>118</b>	<b>100%</b>	<b>50</b>	<b>100%</b>	<b>168</b>	<b>100%</b>
<b>Use appropriate technique(s) to solve the problem</b>	Exceeds	76	64.4%	38	76.0%	116	67.9%
	Meets	22	18.6%	7	14.0%	29	17.3%
	Failed to meet	20	17.0%	5	10.0%	25	14.8%
	<b>Total</b>	<b>118</b>	<b>100%</b>	<b>50</b>	<b>100%</b>	<b>168</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for defining problems: 79.2%

Percentage of MSDAIS students who met or exceeded expectations for applying appropriate statistical techniques: 85.2%

Explanation of Results: In QMST 5334 - Statistical Methods for Business, more than 80% of the MSDAIS students met or exceeded the standards for applying appropriate statistical techniques for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #1 for the year. However, for defining the problem, MSDAIS students just missed the 80% goal, with 79.2% exceeding or meeting the expectation. It is positive that more than 80% of the MSDAIS students successfully used appropriate statistical techniques to solve real-world business problems. The instructors will assign additional reading material emphasizing defining real-world problems.

**SUMMARY STATISTICS FOR OUTCOME #1 IN CIS 5357 - Computing for Data Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
<b>Define problem</b>	Exceeds	32	84.22	14	73.68	46	80.70
	Meets	3	7.89	5	26.32	8	14.04
	Failed to meet	3	7.89	0	0.00	3	5.26
	<b>Total</b>	<b>38</b>	<b>100.00</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.0</b>
<b>Develop code to implement solution for the given problem</b>	Exceeds	32	84.22	14	73.68	46	80.70
	Meets	3	7.89	5	26.32	8	14.04
	Failed to meet	3	7.89	0	0.00	3	5.26
	<b>Total</b>	<b>38</b>	<b>100</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.00</b>

Percentage of MSDAIS students who met or exceeded expectations for defining problems: 94.7%

Percentage of MSDAIS students who met or exceeded expectations for developing code to implement solution for the given problem: 94.7%

Explanation of Results: In CIS 5357 - Computing for Data Analytics, more than 80% of the MSDAIS students met or exceeded the standards for defining problems and developing code to implement solution for the given problem for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #1 for the year. It is positive that more than 80% of the MSDAIS students successfully defined problems and developed code to implement solution for the given problems. Students' performance indicates they can define the problem and then develop the code to implement solution in absence of time pressure (one week for assignment vs. three hours for examination).

Action Plan:

1. For QMST 5334 - Statistical Methods for Business: Additional reading material emphasizing successful factors in defining real-world problems will be included.
2. For CIS 5357 - Computing for Data Analytics: (a) Increase the number of out-of-class assignments that are shorter and focused on a concept. This will allow students to do more assignments, which are shorter but focused on application of one concept. (b) Use out-of-class video series explaining Python concepts. (c) Adopt a textbook that has adequate coverage of advanced concepts discussed in class.

**Outcome 2**  
**Category:** Student Learning Outcome

**Demonstrate analytical skills to develop data-driven solutions for problems.**

The **standards** of performance for the methods below are:

- Scores of 90% correct or better will indicate that the student exceeds expectations
- Scores greater than 80% correct but less than 90% correct will indicate that the student meets expectations

- Scores less than 80% correct will indicate that the student failed to meet expectations.

It is **expected** that 80% of students enrolled in the course during the academic year will meet or exceed the standards on each learning outcome.

### Outcome 2 - Method 1

**1A. In QMST 5336, Analytics, the assessment technique/rubric for outcome 2 is as follows.** At least one data-based problem in exams will be used to assess students' ability to identify and apply appropriate analytical methods to solve given problem. Excellent scores will properly apply analytical methods and interpret results. Acceptable scores will have some errors in applying analytical methods or interpreting results. Unacceptable scores will have fatal errors in applying analytical methods and interpreting results.

**1B. In CIS 5357, Computing for Data Analytics, the assessment technique/rubric for outcome 2 is as follows.** At least one problem given in exam will assess student's ability to develop and data-driven solution for practical scenarios. Excellent scores will have correctly implemented the data-driven solution for the given problem. Acceptable scores will have some errors in the code implementation. Unacceptable scores will have major errors in implementation and the code may not work for the problem.

### Outcome 2 - Method 1 - Result

#### SUMMARY STATISTICS FOR OUTCOME #2 IN QMST 5336 - Analytics FOR AY 2020-2021

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Identify and apply appropriate analytical methods to solve problems	Exceeds	18	41.86	16	94.12	34	56.67
	Meets	17	39.53	0	0	17	28.33
	Failed to meet	8	18.60	1	5.88	9	15.00
	<b>Total</b>	<b>43</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>60</b>	<b>100</b>

Percentage of MSDAIS students who met or exceeded expectations for identifying and applying appropriate analytical methods to solve problems: 85%

Explanation of Results: In QMST 5336 - Analytics, more than 80% of the MSDAIS students met or exceeded the standards for identifying and applying appropriate analytical methods for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #2 for the year. It is positive that more than 80% of the MSDAIS students understand the concepts of different analytical methods discussed and are able to identify appropriate analytical methods for given real-world scenarios.

#### SUMMARY STATISTICS FOR OUTCOME #2 IN CIS 5357 - Computing for Data Analytics FOR AY 2020-2021

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Develop a data-driven solution for practical scenario	Exceeds	29	76.32	9	47.37	38	66.67
	Meets	3	7.89	6	31.58	9	15.79
	Failed to meet	6	15.79	4	21.05	10	17.54
	<b>Total</b>	<b>38</b>	<b>100.00</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.00</b>

Percentage of MSDAIS students who met or exceeded expectations for developing data-driven solution for practical scenario: 82.5%

Explanation of Results: In CIS 5357 - Computing for Data Analytics, more than 80% of the MSDAIS students met or exceeded the standards for developing data-driven solution for the given practical scenario for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #2 for the year. It is positive that more than 80% of the MSDAIS students successfully developed data-driven solution for the given practical scenario. Students' performance indicates that they are able to master concepts but have some difficulty in developing solution within time constraints of an examination.

Action Plan:

1. For QMST 5336 - Analytics: Additional exam questions and assignments will be provided to improve students' understanding and critical thinking.
2. For CIS 5357 - Computing for Data Analytics: (a) Use out-of-class video series explaining Python concepts. (b) Adopt a textbook that has adequate coverage of advanced concepts discussed in class.

### Outcome 2 - Method 2

**2A. In CIS 5357, Computing for Data Analytics, the assessment technique/rubric for outcome 2 is as follows.** An out-of-class project will require students to extract/collect data for a problem, read the data, and implement data-driven solution to provide insights for the problem. Excellent scores will have implemented the solution and provided insights for the given problem. Acceptable scores will have some error in the code implementation for the solution or insights provided. Unacceptable scores will have major errors in the code implementation and insights provided, and the code may not work for the problem.

**2B. In QMST 5335, Forecasting & Simulation, the assessment technique/rubric for outcome 2 is as follows.** Three projects will require students to develop data-driven solutions for practical problems. First project will require students to use appropriate forecasting methods to develop forecasts for given data. Second project will require students to use simulation for evaluating different scenarios. Third project will require students to analyze and use data to simulate a complex system for decision making. For the first project, excellent scores will have correct selection and implementation of appropriate forecasting method. Acceptable scores will have some errors in the implementation of forecasting method. Unacceptable scores will have major errors in selection and implementation of forecasting method. For the second and third projects, excellent scores will have correctly implemented solution and interpreted results. Acceptable scores will have some errors in interpretation of results. Unacceptable scores will have major errors in the implemented simulation and interpretation of results.

**Outcome 2 - Method 2 - Result**

**SUMMARY STATISTICS FOR OUTCOME #2 IN CIS 5357 - Computing for Data Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
<b>Extract/collect data for a problem</b>	Exceeds	32	84.22	14	73.68	46	80.70
	Meets	3	7.89	5	26.32	8	14.04
	Failed to meet	3	7.89	0	0.00	3	5.26
	<b>Total</b>	<b>38</b>	<b>100.00</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.0</b>
<b>Read data and implement data-driven solution to provide insights for the problem</b>	Exceeds	32	84.22	14	73.68	46	80.70
	Meets	3	7.89	5	26.32	8	14.04
	Failed to meet	3	7.89	0	0.00	3	5.26
	<b>Total</b>	<b>38</b>	<b>100</b>	<b>19</b>	<b>100.00</b>	<b>57</b>	<b>100.00</b>

Percentage of MSDAIS students who met or exceeded expectations for extracting data for a given problem: 94.7%

Percentage of MSDAIS students who met or exceeded expectations for reading data and implementing data-driven solution to provide insights for the given problem: 94.7%

Explanation of Results: In CIS 5357 - Computing for Data Analytics, more than 80% of the MSDAIS students met or exceeded the standards for extracting and reading data and implementing data-driven solution to provide insights for the given problem for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #2 for the year. It is positive that more than 80% of the MSDAIS students successfully extracted and read data and implemented data-driven solution to provide insights for the given problems. Students' performance for this assessment method indicates they can extract and read data and implement solution to provide insight in absence of time pressure (one week for assignment vs. three hours for examination).

**SUMMARY STATISTICS FOR OUTCOME #2 IN QMST 5335 - Forecasting & Simulation FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
<b>Use appropriate forecasting methods to develop forecasts for given data</b>	Exceeds	11	73.3%	40	91%	51	86.4%
	Meets	3	20%	4	9%	7	11.9%
	Failed to meet	1	6.7%	0	0%	1	1.7%
	<b>Total</b>	<b>15</b>	<b>100%</b>	<b>44</b>	<b>100%</b>	<b>59</b>	<b>100%</b>
<b>Use simulation for evaluating different scenarios</b>	Exceeds	9	60%	44	100%	53	89.8%
	Meets	6	40%	0	0%	6	10.2%
	Failed to meet	0	0%	0	0%	0	0%
	<b>Total</b>	<b>15</b>	<b>100%</b>	<b>44</b>	<b>100%</b>	<b>59</b>	<b>100%</b>

**Analyze and use data to simulate a complex system for decision making**

Exceeds	13	86.7%	23	52.3%	36	61%
Meets	2	13.3%	12	27.3%	14	23.7%
Failed to meet	0	0%	9	20.4%	9	15.3%
<b>Total</b>	<b>15</b>	<b>100%</b>	<b>44</b>	<b>100%</b>	<b>59</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for using appropriate forecasting methods to develop forecasts for given data: 98.3%

Percentage of MSDAIS students who met or exceeded expectations for using simulation for evaluating different scenarios: 100.0%

Percentage of MSDAIS students who met or exceeded expectations for analyzing and using data to simulate a complex system for decision making: 84.7%

Explanation of Results: In QMST 5335 - Forecasting & Simulation, more than 80% of the MSDAIS students met or exceeded the standards for using appropriate forecasting methods to develop forecasts, using simulation for evaluating different scenarios, and analyzing and using data to simulate a complex system for decision making for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #2 for the year. It is positive that more than 80% of the MSDAIS students successfully used appropriate forecasting methods to develop forecasts, used simulation to evaluate different scenarios, and analyzed and used data to simulate a complex system for decision making for the given problems.

Action Plan:

- For CIS 5357 - Computing for Data Analytics: (a) Increase the number of out-of-class assignments that are shorter and focused on a concept. This will allow students to do more assignments, which are shorter but focused on application of one concept. (b) Use out-of-class video series explaining Python concepts. (c) Adopt a textbook that has adequate coverage of advanced concepts discussed in class.
- For QMST 5335 - Forecasting & Simulation: (a) The project for analyzing and using data to simulate a complex system for decision making will be assigned to students earlier to ensure students have more time for the project. (b) Increase the number of meetings with students to discuss project details and project progress.

**Outcome 3**

**Category:** Student Learning Outcome

**Ability to analyze large datasets and develop modeling solutions to support decision making.**

The **standards** of performance for the methods below are:

- Scores of 90% correct or better will indicate that the student exceeds expectations
- Scores greater than 80% correct but less than 90% correct will indicate that the student meets expectations
- Scores less than 80% correct will indicate that the student failed to meet expectations.

It is **expected** that 80% of students enrolled in the course during the academic year will meet or exceed the standards on each learning outcome.

**Outcome 3 - Method 1**

**1A. In QMST 5336, Analytics, the assessment technique/rubric for outcome 3 is as follows.** At least one problem in exam will be used to assess students' ability to analyze a dataset and interpret the result to support decision making. Excellent scores will have correctly analyzed data and interpreted results to support decision making. Acceptable scores will have some errors in data analysis or interpretation of results. Unacceptable scores will have major errors in use of data analysis and interpretation of results for decision making.

**1B. In CIS 5367, Machine Learning, the assessment technique/rubric for outcome 3 is as follows.** At least one problem in exam will be used to assess students' ability to apply machine learning models for implementing decision systems. Excellent scores will have successfully implemented decision systems using appropriate machine learning models. Acceptable scores will have some errors in implementing the system or using appropriate machine learning models. Unacceptable scores will have major errors in implementation and use of machine learning models for the system.

**Outcome 3 - Method 1 - Result**

**SUMMARY STATISTICS FOR OUTCOME #3 IN QMST 5336 - Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
<b>Analyze a dataset and interpret the result to support decision making</b>	Exceeds	35	81.40	12	70.59	47	78.33
	Meets	6	13.95	3	17.65	9	15.00
	Failed to meet	2	4.65	2	11.76	4	6.67

Total                    43                    100                    17                    100                    60                    100

Percentage of MSDAIS students who met or exceeded expectations for analyzing a dataset and interpret the result to support decision making: 93.3%

Explanation of Results: In QMST 5336 - Analytics, more than 80% of the MSDAIS students met or exceeded the standards for analyzing datasets and interpreting results to support decision making for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #3 for the year. It is positive that more than 80% of the MSDAIS students were able to analyze datasets and interpret results to support decision making for given real-world scenarios.

**SUMMARY STATISTICS FOR OUTCOME #3 IN CIS 5367 - Machine Learning FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Apply machine learning models for implementing decision systems	Exceeds			22	92%	22	92%
	Meets			1	4%	1	4%
	Failed to meet			1	4%	1	4%
	<b>Total</b>			<b>24</b>	<b>100%</b>	<b>24</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for applying machine learning models for implementing decision systems: 96.0%

Explanation of Results: In CIS 5367 - Machine Learning, more than 80% of the MSDAIS students met or exceeded the standards for applying machine learning models for implementing decision systems for the given practical scenario for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #3 for the year. It is positive that more than 80% of the MSDAIS students successfully applied machine learning models to implement decision systems for the given practical scenario.

Action Plan:

1. For QMST 5336 - Analytics: (a) Additional exam questions to test students' ability to analyze and interpret results for real-world datasets.
2. For CIS 5367 - Machine Learning: (a) Use a cloud-based computing platform to develop and implement machine-learning projects to overcome memory and computing limitations of computers owned and used by students. This will enable deeper discussion about developing machine learning models for implementing decision systems.

**Outcome 3 - Method 2**

**2A. In QMST 5336, Analytics, the assessment technique/rubric for outcome 3 is as follows.** An out-of-class project will require students to analyze dataset(s) using appropriate analytical methods to support data-driven decision making for a specific problem. Excellent scores will apply appropriate analytical methods to support decision making. Acceptable scores will have some errors in applying analytical methods to decision making. Unacceptable scores will have major errors in applying analytical methods to decision making.

**2B. In CIS 5367, Machine Learning, the assessment technique/rubric for outcome 3 is as follows.** At least one assignment will be used to assess students' ability to apply machine learning models for implementing decision systems. Excellent scores will have successfully implemented decision systems using appropriate machine learning models. Acceptable scores will have some errors in implementing the system or using appropriate machine learning models. Unacceptable scores will have major errors in implementation and use of machine learning models for the system.

**Outcome 3 - Method 2 - Result**

**SUMMARY STATISTICS FOR OUTCOME #3 IN QMST 5336 - Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Analyze data set(s) using appropriate analytical methods to support data-driven decision making for a problem	Exceeds	14	32.56	0	0	14	23.33
	Meets	19	44.19	13	76.47	32	53.33
	Failed to meet	10	23.26	4	23.53	14	23.33
	<b>Total</b>	<b>43</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>60</b>	<b>100</b>

Percentage of MSDAIS students who met or exceeded expectations for analyzing a dataset using appropriate analytical methods to support data-driven decision making for a given problem: 76.7%

Explanation of Results: In QMST 5336 - Analytics, MSDAIS students missed the 80% goal for the year as 76.7% students met or exceeded the

expectation for method #2 of learning outcome #3. It was identified that students can analyze dataset using appropriate analytical methods but have some difficulty in using the results to support decision making for the given problem scenario.

**SUMMARY STATISTICS FOR OUTCOME #3 IN CIS 5367 - Machine Learning FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Ability to apply machine learning models for implementing decision systems	Exceeds			24	100%	24	100%
	Meets			0	0%	0	0%
	Failed to meet			0	0%	0	0%
	<b>Total</b>			<b>24</b>	<b>100%</b>	<b>24</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for applying machine learning models for implementing decision systems: 100.0%

Explanation of Results: In CIS 5367 - Machine Learning, more than 80% of the MSDAIS students met or exceeded the standards for applying machine learning models for implementing decision systems for the given practical scenario for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #3 for the year. It is positive that more than 80% of the MSDAIS students successfully applied machine learning models to implement decision systems for a real-world scenario.

Action Plan:

1. For QMST 5336 - Analytics: (a) Provide more practice exercises and case studies to enhance ability to make data-driven decisions using analytical results from data.
2. For CIS 5367 - Machine Learning: (a) Use a cloud-based computing platform to develop and implement machine-learning projects to overcome memory and computing limitations of computers owned and used by students. This will enable deeper discussion about developing machine learning models for implementing decision systems.

**Outcome 4**  
**Category:** Student Learning Outcome

**Apply knowledge and technical skills to perform prescriptive analytics.**

The **standards** of performance for the methods below are:

- Scores of 90% correct or better will indicate that the student exceeds expectations
- Scores greater than 80% correct but less than 90% correct will indicate that the student meets expectations
- Scores less than 80% correct will indicate that the student failed to meet expectations.

It is **expected** that 80% of students enrolled in the course during the academic year will meet or exceed the standards on each learning outcome.

**Outcome 4 - Method 1**

**1A. In QMST 5336, Analytics, the assessment technique/rubric for outcome 4 is as follows.** At least one problem in exams will be used to assess students' ability to use optimization and/or decision analysis for a given scenario. Excellent scores will correctly formulate and solve the problem, as well as properly explain the results. Acceptable scores will have some errors in formulating, solving process, or explaining results. Unacceptable scores will have major errors in formulating, solving process, and explaining results.

**1B. In QMST 5332, Optimization, the assessment technique/rubric for outcome 4 is as follows.** Several exam questions will assess student's prescriptive analytics skills and knowledge, which includes formulating optimization models (e.g., linear, integer, mixed-integer) and solving optimization models using different tools (e.g., MS Excel, Matlab) for practical scenarios. Excellent scores will have correct formulation, implementation, and interpretation of results. Acceptable scores will have some errors in formulation, implementation, or interpretation of results. Unacceptable scores will have major errors in formulation, implementation, and interpretation of results.

**Outcome 4 - Method 1 - Result**

**SUMMARY STATISTICS FOR OUTCOME #4 IN QMST 5336 - Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Use optimization and/or decision analysis for a scenario	Exceeds	4	9.3	7	41.18	11	18.33
	Meets	11	25.58	4	23.53	15	25.00
	Failed to meet	28	65.11	6	35.29	34	56.67
	<b>Total</b>	<b>43</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>60</b>	<b>100</b>



Percentage of MSDAIS students who met or exceeded expectations for using optimization and decision analysis for a given scenario: 43.3%  
 Explanation of Results: In QMST 5336 - Analytics, MSDAIS students missed the 80% goal for the year as 43.3% students met or exceeded the expectation for method #1 of learning outcome #4. It was identified that students found this topic relatively difficult. Instructor plans to spend more time in class on this topic and provide more out-of-class practice exercises to improve students' performance.

**SUMMARY STATISTICS FOR OUTCOME #4 IN QMST 5332 - Optimization FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Apply prescriptive analytics skills and knowledge	Exceeds	23	71.9%			23	71.9%
	Meets	5	15.6%			5	15.6%
	Failed to meet	4	12.5%			4	12.5%
	<b>Total</b>	<b>32</b>	<b>100%</b>			<b>32</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for applying prescriptive analytics skills and knowledge: 87.5%  
 Explanation of Results: In QMST 5332 - Optimization, more than 80% of the MSDAIS students met or exceeded the standards for applying prescriptive analytics skills and knowledge for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #4 for the year. It is positive that more than 80% of the MSDAIS students successfully applied prescriptive analytics skills and knowledge for the given problems.

Action Plan:

- For QMST 5336 - Analytics: (a) Provide additional out-of-class practice exercises to enhance students' comprehension of the use of optimization and decision analysis for a given scenario. (b) Revise the lecture content to make it easier for students to comprehend optimization and decision analysis concepts and methods.
- For QMST 5332 - Optimization: (a) Prepare a video to provide students with introduction to MATLAB, which may further improve student performance.

**Outcome 4 - Method 2**

**2A. In QMST 5336, Analytics, the assessment technique/rubric for outcome 4 is as follows.** An out-of-class project will be used to assess students' ability to use appropriate prescriptive analytics to support data-driven decision making in a given scenario. Excellent scores will demonstrate strong capacity of using appropriate prescriptive analytics to support real-life decision making. Acceptable scores will have some errors in performing prescriptive analytics or interpreting results to support decision making. Unacceptable scores will have major errors in performing prescriptive analytics or interpreting results in decision making.

**2B. In QMST 5332, Optimization, the assessment technique/rubric for outcome 4 is as follows.** A project will assess student's ability to apply prescriptive analytics skills and knowledge to analyze practical optimization problems and their solution concepts. Excellent scores will have correct formulation, analysis, and interpretation of problems and concepts. Acceptable scores will have some errors in formulation, analysis, or interpretation of problems and concepts. Unacceptable scores will have major errors in formulation, analysis, and interpretation of problems and concepts.

**Outcome 4 - Method 2 - Result**

**SUMMARY STATISTICS FOR OUTCOME #4 IN QMST 5336 - Analytics FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Use appropriate prescriptive analytics to support data-driven decision making for a scenario	Exceeds	15	34.88	12	70.59	27	45
	Meets	24	55.81	5	29.4	29	48.33
	Failed to meet	4	9.30	0	0	4	6.67
	<b>Total</b>	<b>43</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>60</b>	<b>100</b>

Percentage of MSDAIS students who met or exceeded expectations for using appropriate prescriptive analytics to support data-driven decision making for a scenario: 93.3%  
 Explanation of Results: In QMST 5336 - Analytics, more than 80% of the MSDAIS students met or exceeded the standards for using appropriate prescriptive analytics to support data-driven decision making for a scenario for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #4 for the year. It is positive that more than 80% of the MSDAIS students successfully used prescriptive analytics to support data-driven decision making for a scenario.

**SUMMARY STATISTICS FOR OUTCOME #4 IN QMST 5332 - Optimization FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%

**Ability to apply prescriptive analytics skills and knowledge to analyze practical optimization problems and their solution concepts**

Exceeds	15	46.9%	15	46.9%
Meets	17	53.1%	17	53.1%
Failed to meet	0	0%	0	0%
<b>Total</b>	<b>32</b>	<b>100%</b>	<b>32</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for their ability to apply prescriptive skills and knowledge to analyze practical optimization problems and solution concepts for scenarios: 100.0%

Explanation of Results: In QMST 5332 - Optimization, more than 80% of the MSDAIS students met or exceeded the standards for their ability to apply prescriptive skills and knowledge to analyze practical optimization problems and solution concepts for a scenario for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #4 for the year. It is positive that more than 80% of the MSDAIS students successfully applied prescriptive analytics skills and knowledge to analyze practical optimization problems and solution concepts for given scenarios.

Action Plan:

- For QMST 5336 - Analytics: (a) Provide additional out-of-class practice exercises to enhance students' comprehension of the use of optimization and decision analysis for a given scenario. (b) Revise the lecture content to make it easier for students to comprehend optimization and decision analysis concepts and methods. (c) Require students to meet instructor more often outside class to discuss their out-of-class project.
- For QMST 5332 - Optimization: (a) Prepare a video to provide students with introduction to MATLAB, which may further improve student performance.

**Outcome 5**

**Category:** Student Learning Outcome

**Design and implement data management strategies.**

The **standards** of performance for the methods below are:

- Scores of 90% correct or better will indicate that the student exceeds expectations
- Scores greater than 80% correct but less than 90% correct will indicate that the student meets expectations
- Scores less than 80% correct will indicate that the student failed to meet expectations.

It is **expected** that 80% of students enrolled in the course during the academic year will meet or exceed the standards on each learning outcome.

**Outcome 5 - Method 1**

**1A. In CIS 5355, Database Management Systems, the assessment technique/rubric for outcome 5 is as follows.** CIS 5355 will use exam-embedded questions. Two components assessed include ability to design and implement database and query database to retrieve data for a business scenario. For the first component, at least one exam question will be used to assess students' ability to develop conceptual database design and implement a relational database schema for given business data management requirements. For the second component, several exam questions will require students to write Structure Query Language (SQL) statements to generate required business information. For the first component, excellent scores will have correct conceptual database design and implementation of database schema. Acceptable scores will have some errors in the conceptual database design or implementation of relational schema. Unacceptable scores will have major errors in database design and implementation of relational schema. For the second component, excellent scores will have correct SQL statements that generates required business information. Acceptable scores will have some errors in the SQL statements. Unacceptable scores will have major errors in the SQL statements that do not execute or generates incorrect information.

**1B. In CIS 5364, Data Warehousing, the assessment technique/rubric for outcome 5 is as follows.** At least one exam question will be used to assess students' ability to develop data warehouse design for given business data analysis requirements. Excellent scores will have correct data warehouse design to support data analysis requirements. Acceptable scores will have some errors in the data warehouse design. Unacceptable scores will have major errors in the data warehouse design which causes data management and analysis issues.

**Outcome 5 - Method 1 - Result**

**SUMMARY STATISTICS FOR OUTCOME #5 IN CIS 5355 - Database Management Systems FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Develop conceptual database design for a scenario	Exceeds	25	78%	12	70.59	37	75.5%

Meets	4	13%	4	23.53	8	16.3%
Failed to meet	3	9%	1	5.88	4	8.2%
<b>Total</b>	<b>32</b>	<b>100%</b>	<b>17</b>	<b>100.00</b>	<b>49</b>	<b>100%</b>

**Implement a relational database schema for a business scenario**

Exceeds	25	78%	12	70.59	37	75.5%
Meets	2	6%	4	23.53	6	12.25%
Failed to meet	5	16%	1	5.88	6	12.25%
<b>Total</b>	<b>32</b>	<b>100%</b>	<b>17</b>	<b>100.00</b>	<b>49</b>	<b>100%</b>

**Write Structured Query Language statements to generate required information for a scenario**

Exceeds	15	47%	9	52.95	24	49%
Meets	12	38%	6	35.29	18	36.7%
Failed to meet	5	16%	2	11.76	7	14.3%
<b>Total</b>	<b>32</b>	<b>100%</b>	<b>17</b>	<b>100.00</b>	<b>49</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for developing conceptual database design for a given scenario: 91.8%  
 Percentage of MSDAIS students who met or exceeded expectations for implementing relational database schema for a business scenario: 87.8%  
 Percentage of MSDAIS students who met or exceeded expectations for writing Structured Query Language statements to generate required information for a scenario: 85.7%

Explanation of Results: In CIS 5355 - Database Management Systems, more than 80% of the MSDAIS students met or exceeded the standards for developing conceptual database design for a given scenario, implementing relational database schema for a given business scenario, and writing Structured Query Language statements to generate required information for a scenario for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #5 for the year. It is positive that more than 80% of the MSDAIS students could for a given scenario develop conceptual database design, implement relational database schema, and write Structured Query Language statements to generate required information.

**SUMMARY STATISTICS FOR OUTCOME #5 IN CIS 5364 - Data Warehousing FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Develop data warehouse design for a scenario	Exceeds			27	90	27	90
	Meets			3	10	3	10
	Failed to meet			0	0	0	0
	<b>Total</b>			<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

Percentage of MSDAIS students who met or exceeded expectations for their ability to develop data warehouse design for a given scenario: 100.0%  
 Explanation of Results: In CIS 5364 - Data Warehousing, more than 80% of the MSDAIS students met or exceeded the standards for their ability to develop data warehouse design for a given scenario for method #1 of this learning outcome, thus achieving the performance expectations for learning outcome #5 for the year. It is positive that more than 80% of the MSDAIS students successfully developed data warehouse design for given scenarios.

Action Plan:

- For CIS 5355 - Database Management Systems: (a) Provide additional practice exercises for using SQL to implement relational database schedule for given business scenario. (b) Devote more time in class to explain concepts and do in-class exercises for writing SQL statements to generate required information and for implementing database schema.
- For CIS 5364 - Data Warehousing: (a) Prepare and use more detailed slide-set and in-class examples to further improve student performance. (b) Use a cloud-based data warehousing platform to implement data warehouse to overcome technical issues encountered by students using Mac computers. This will enhance discussion about data warehouse implementation as more companies are using cloud-based platform.

**Outcome 5 - Method 2**

**2A. In CIS 5355, Database Management Systems, the assessment technique/rubric for outcome 5 is as follows.** Two components assessed include ability to design and implement database and query database to retrieve data for a business scenario. For the first component, at least one out-of-class assignment will be used to assess students' ability to develop conceptual database design and implement a relational database schema for given business data management requirements. For the second component, several assignment questions will require students to write

Structure Query Language (SQL) statements to generate required business information. For the first component, excellent scores will have correct conceptual database design and implementation of database schema. Acceptable scores will have some errors in the conceptual database design or implementation of relational schema. Unacceptable scores will have major errors in database design and implementation of relational schema. For the second component, excellent scores will have correct SQL statements that generates required business information. Acceptable scores will have some errors in the SQL statements. Unacceptable scores will have major errors in the SQL statements that do not execute or generates incorrect information.

**2B. In CIS 5364, Data Warehousing, the assessment technique/rubric for outcome 5 is as follows.** One assignment question will be used to assess students' ability to develop data warehouse design for given business data analysis requirements. Excellent scores will have correct data warehouse design to support data analysis requirements. Acceptable scores will have some errors in the data warehouse design. Unacceptable scores will have major errors in the data warehouse design which causes data management and analysis issues.

**Outcome 5 - Method 2 - Result**

**SUMMARY STATISTICS FOR OUTCOME #5 IN CIS 5355 - Database Management Systems FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Develop conceptual database design for a scenario	Exceeds	16	50%	7	41.18	23	47%
	Meets	13	41%	7	41.18	20	40.8%
	Failed to meet	3	9%	3	17.64	6	12.2%
	<b>Total</b>	<b>32</b>	<b>100%</b>	<b>17</b>	<b>100.0</b>	<b>49</b>	<b>100%</b>
Implement a relational database schema for a business scenario	Exceeds	10	31%	7	41.18	17	34.7%
	Meets	13	41%	7	41.18	20	40.8%
	Failed to meet	9	28%	3	17.64	12	24.5%
	<b>Total</b>	<b>32</b>	<b>100%</b>	<b>17</b>	<b>100.00</b>	<b>49</b>	<b>100%</b>
Write Structured Query Language statements to generate required information for a scenario	Exceeds	23	72%	12	70.59	35	71.4%
	Meets	7	22%	5	29.41	12	24.5%
	Failed to meet	2	6%	0	0.00	2	4.1%
	<b>Total</b>	<b>32</b>	<b>100%</b>	<b>17</b>	<b>100.00</b>	<b>49</b>	<b>100%</b>

Percentage of MSDAIS students who met or exceeded expectations for developing conceptual database design for a given scenario: 87.8%  
 Percentage of MSDAIS students who met or exceeded expectations for implementing relational database schema for a business scenario: 75.5%  
 Percentage of MSDAIS students who met or exceeded expectations for writing Structured Query Language statements to generate required information for a scenario: 95.9%

Explanation of Results: In CIS 5355 - Database Management Systems, more than 80% of the MSDAIS students met or exceeded the standards for developing conceptual database design for a given scenario and writing Structured Query Language statements to generate required information for a scenario for method #2 of this learning outcome. For implementing relational database schema for a given business scenario, MSDAIS students missed the 80% cutoff as 75.5% exceeded or met expectations. More in-class and out-of-class exercises will be used to improve performance for implementing relational schema for a business scenario.

**SUMMARY STATISTICS FOR OUTCOME #5 IN CIS 5364 - Data Warehousing FOR AY 2020-2021**

Performance Area	Performance	Fall 2020		Spring 2021		Total (Fall 2020 + Spring 2021)	
		Raw #	%	Raw #	%	Raw #	%
Develop data warehouse design for a scenario	Exceeds			27	90	27	90
	Meets			3	10	3	10
	Failed to meet			0	0	0	0

Total

30

100

30

100

Percentage of MSDAIS students who met or exceeded expectations for their ability to develop data warehouse design for a given scenario: 100.0%  
Explanation of Results: In CIS 5364 - Data Warehousing, more than 80% of the MSDAIS students met or exceeded the standards for their ability to develop data warehouse design for a given scenario for method #2 of this learning outcome, thus achieving the performance expectations for learning outcome #5 for the year. It is positive that more than 80% of the MSDAIS students successfully developed data warehouse design for given scenarios.

Action Plan:

1. For CIS 5355 - Database Management Systems: (a) Provide additional practice exercises for using SQL to implement relational database schedule for given business scenario. (b) Devote more time in class to explain concepts and do in-class exercises for writing SQL statements to generate required information and for implementing database schema.
2. For CIS 5364 - Data Warehousing: (a) Prepare and use more detailed slide-set and in-class examples to further improve student performance. (b) Use a cloud-based data warehousing platform to implement data warehouse to overcome technical issues encountered by students using Mac computers. This will enhance discussion about data warehouse implementation as more companies are using cloud-based platform.

#### Outcome 6

**Goal:** 1. Promote the success of all students.

**Initiative:** 1.3 Increase student retention and graduation rates.

**The academic program will promote and realize gains in student success.**

#### Outcome 6 - Method 1

**Student retention success will be measured by observing one year retention rates of students enrolled in the academic program from their first to second year.** Data will be obtained from the university's certified enrollment records at the end of the fall semester. Rates of retention success will be expected to be at or above the university average for this level of program.

#### Outcome 6 - Method 1 - Result

The number of entering students enrolled in the academic program in 2019-2020 was 20. In this program, 19 of the 20 students returned for their second year in fall of 2020 for a one-year retention rate of 95.0%.

#### Outcome 6 - Method 2

**Student graduation success will be measured by observing the number of graduates from the academic program in during the fall, spring, and summer semesters and comparing the number of graduates to the number of students enrolled in the program.** Data will be obtained from the university's certified enrollment records for the fall, spring, and summer semesters. The number of graduates is expected to be at or above the university rate of graduation for this level of program.

#### Outcome 6 - Method 2 - Result

*The number of students graduating from the degree program during the 2020-2021 year (i.e., Fall 2020 and Spring 2021 semesters) along with the total number of students enrolled in the program provided the data to assess student graduation success. In this program, 19 of the 66 students enrolled in the program graduated in the Fall 2020 and Spring 2021 semesters for a graduation percentage of 28.8%.*

#### Outcome 7

**Goal:** 4. Provide the necessary services, resources, and infrastructure to support the university's strategic direction.

**Initiative:** 4.9 Provide a diverse and inclusive environment of support to achieve the highest level of performance for all member of the campus community.

**The academic program will promote and realize diversity among its student population.**

#### Outcome 7 - Method 1

**Student gender diversity will be measured by reviewing the number and percentage of male and female students enrolled in the academic program during the fall, spring, and summer semesters.** Data will be obtained from the university's certified enrollment records at the end of the fall semester. Student gender diversity will be expected to be balanced (50/50).

#### Outcome 7 - Method 1 - Result

In the MSDAIS program in Fall 2020, 44 of the 66 students enrolled were female while 22 of the students were male. Thus, 66.7% of student population in the MSDAIS program is female and 33.3% of the student population is male.

#### Outcome 7 - Method 2

**Student racial and ethnic diversity will be measured by observing race and ethnicity of students enrolled in the academic program during the fall, spring, and summer semesters.** Data will be obtained from the university's certified enrollment records at the end of the fall semester. Student racial and ethnic diversity will be expected to mirror percentages in the population of the state of Texas.

#### Outcome 7 - Method 2 - Result

The number students of various ethnic backgrounds enrolled in the MSDAIS program during the 2020-2021 fall semester (i.e., Fall 2020) provided the data to assess ethnic and racial diversity. In this program, 6 of the 66 students or 9.1% were African-American; 9 of the 66 students or 13.6% were Asian; 8 of the 66 students or 12.1% were Hispanic; 1 of the 66 student or 1.5% was Multi-race, Non-Hispanic, Non-Black; 13 of the 66 students or 19.7% were White; 2 of the 66 students or 3.0% were Unknown; 27 of the 66 students or 40.9% were of nonresident International students.

**Approval History**

**Approval History Event**

Outcomes Approved Level 1

Outcomes Approved Level 2

Outcomes Audit Report Submitted

**Approver**

Robert Jewell (rtj14)

Sanjay Ramchander (s\_r828)

William Chittenden (wc10)