

# Syllabus for

# ITM 715

# Data Science

**NOTE:** This syllabus document contains the basic information for this course. The most current syllabus is available in the full course.

## Prerequisites

NA

## Course Description

Examine key data science concepts, methods, and processes. Address issues for developing, managing and supporting data-driven decision-making in the organization. Gain knowledge and tools for incorporating data science into IT project workflows. Topics include, but are not limited to, data analytics, data warehousing, machine learning, and artificial intelligence.

## Course Alignment with Program Outcomes

This course addresses the following competencies and program outcomes of the Master of Science in Information Technology Management.

Competency E) Investigate and plan innovative solutions for business challenges

- Program Outcome 14: Evaluate the impact of emerging technologies
- Program Outcome 16: Analyze requirements and propose technical solutions

Competency F) Engineer, develop and deploy strategies for enterprise systems

- Program Outcome 17: Develop appropriate data management technologies
- Program Outcome 18: Create and deploy enterprise solutions in support of organizational goals
- Program Outcome 19: Plan and implement projects related to infrastructure, security, software development or data analysis

## Course Learning Objectives

Upon completion of the course, you will be able to do the following:

- 1: Evaluate the impact of Data Science based technologies for business challenges
- 2: Identify the application requirements of data science solutions in business organizations
- 3: Implement software applications for data analysis
- 4: Develop software products for data analysis
- 5: Deploy data science applications in data analysis
- 6: Develop data management technologies for data analysis

## Course Activities and Assessments

This course uses a variety of video tutorials, discussions, assignments, quizzes, and projects for formative feedback and assessment of learning. You will use discussion boards to share, evaluate and reflect on what you have learned in the course.

### Course Outline

Unit Topic	Lessons
1.0 Introduction to Data Science	Lesson 1.1 Course Introduction and Software
	Lesson 1.2 Data Science Concepts
2.0 Data Analysis	Lesson 2.1 Populations, samples, datasets and types of data
	Lesson 2.2 Measures of Central Tendency
	Lesson 2.3 Charts for Numeric Variables
	Lesson 2.4 Relationships in Categorical and Numerical Variables
	Lesson 2.5 Correlation, covariance, multiple variables
3.0 Business Intelligence and Databases	Lesson 3.1 Relational Databases
	Lesson 3.2 Data Visualization, Data Cleansing
4.0 Probability and Decision Making under Uncertainty	Lesson 4.1 Probability
	Lesson 4.2 Distributions
	Lesson 4.3 Decision Analysis
	Lesson 4.4 Decision Trees
5.0 Statistical Inference	Lesson 5.1 Sampling
	Lesson 5.2 Estimation
6.0 Regression Analysis and Time Series	Lesson 6.1 Graphing Relationships
	Lesson 6.2 Linear Regression
	Lesson 6.3 Statistical Inference
	Lesson 6.4 Multicollinearity and Prediction
	Lesson 6.5 Forecasting
7.0 Data Mining and Data Warehousing	Lesson 7.1 Classification Methods
	Lesson 7.2 Clustering Methods
8.0 Python for Data Science	Lesson 8.1 Basic Data Structures and Conditional Statements in Python
	Lesson 8.2 Data Manipulation in Python
	Lesson 8.3 Data Science in Python
9.0 Integrative Project	Lesson 9.1 Final Project Presentation
	Lesson 9.2 Reviewing Data Science Projects

## Grading

Assessments	Point Value
Discussions	200
Assignments	155
Quizzes	1512
Final Project	100
Total	1967

Letter Grade	Percentage
<b>A</b>	100-90%
<b>A-</b>	<90-85%
<b>B+</b>	<85-80%
<b>B</b>	<80-75%
<b>B-</b>	<75-70%
<b>C+</b>	<70-65%
<b>C</b>	<65-60%
<b>C-</b>	<60-55%
<b>F</b>	<55-50%