Master's in Data Analytics: Course Schedule & Descriptions

Recommended Course Sequence

2 Year Completion - 6 credits a semester

Fall Entry Recommended Sequence		Spring Entry Recommended Sequence		Summer Entry Recommended Sequence	
Fall 1A*	ANA 500	Spring 1A*	ANA 500	Summer 1A	ANA 500
Fall 1B	ANA 505	Spring 1B	ANA 505	Summer 1B*	ANA 505
Spring 1A*	ANA 510	Summer 1A	ANA 510	Fall 1A*	ANA 510
Spring 1B	ANA 515	Summer 1B*	ANA 515	Fall 1B	ANA 515
Summer 1A		Fall 1A*	ANA 522	Spring 1A*	ANA 522
Summer 1B		Fall 1B	ANA 525	Spring 1B	ANA 525
Fall 2A*	ANA 522	Spring 2A*	ANA 530	Summer 2A	

Fall 2B	ANA 525	**Spring 2B**	ANA 535	**Summer 2B**	
Spring 2A*	ANA 530	**Summer 2A**		**Fall 2A***	ANA 530
Spring 2B	ANA 535	**Summer 2B**		**Fall 2B**	ANA 535
Summer 2A*	ANA 540	**Fall 2A***	ANA 540	**Spring 2A***	ANA 540
Summer 2B	ANA 555	**Fall 2B**	ANA 555	**Spring 2B**	ANA 555

Please note that students who do not have a job in the data analytics field will be required to take the Practicum course each session. Courses with * indicate hybrid course which requires 3 day on campus residency requirement.

Course Descriptions

ANA 500: Foundations of Data Analytics (3 Credits): This course introduces fundamental techniques of data analysis, emphasizing complex and/or large data sets. Students will be introduced to common software and will begin to connect analysis techniques with decision-making processes.

Upon completion of this course students will have the ability to apply data and analytic principles to real-world problems, understand the data analytics lifecycle from problem definition to solution development, and will be able to articulate how to stitch together analytics, visualization and methodologies to unlock value.

ANA 505: Data Mining (3 Credits): This course is an extension of Foundations of Data Analytics. Focusing on techniques of data mining, students will continue to develop their skills using SAS to learn SQL coding and use SQL Server and/or Oracle to implement algorithms for basic data mining techniques. Students will learn to prepare data, address classification, performance evaluation and clustering among other practices.

Upon completion of this course students will be able to find patterns in databases, perform prediction and forecasting with the data, and know how data algorithms work together, as well as experience in the extraction of

data insights.

ANA 510: Statistical Methods for Data Science and Analytics (3 Credits): This course introduces fundamental techniques of data analysis, emphasizing complex and/or large data sets. Students will be introduced to common software including SAS and will begin to connect analysis technique with decision-making process, visualization, and advanced data mining.

Upon completion of this course students will understand how to apply their understanding of computational statistics to real-world problems.

ANA 515: Fundamentals of Data Storage, Cleaning, and Retrieval (3 Credits): This course focuses on the process of collecting data and preparing it for analysis. Students will learn computational processes to automatically correct errors in large data sets when possible, identifying shortcomings in these approaches and manual approaches when necessary. Students will also learn techniques for error detection using readily available data sets.

This course prepares students to identify data patterns, cluster data, text retrieval, and text mining of both structured and unstructured data.

ANA 522: Fundamentals of Programming in Python (3 Credits): Using the Python language, students will learn concepts around problem solving and algorithm creation, data types and expressions. Python will be presented as both an interpreted and compiled language to work with a variety of data types and to manage data.

With the completion of this course students will understand the fundamental programming concepts that include data structures, networked application program interfaces and databases using the Python programming language

ANA 525: Qualitative Methods in Data Analytics (3 Credits): This course is an introduction to qualitative research. Students will learn the basic foundations of qualitative research methodology and be introduced to key research strategies in qualitative research and research design with the goal of equipping participants with the skills to be able to sensitively and critically design, carry out, report, read, and evaluate the quality of qualitative research projects. Specifically, students will learn the basics of questionnaire design, data collection methods, sampling design, dealing with missing values, making estimates, combining data from different sources, and the analysis of survey data.

With the completion of this course students can formulate qualitative research questions and collect and analyze qualitative data. Students will be exposed to different styles of presenting qualitative research results and will consider different ways in which qualitative data is used in practice.

ANA 530: Quantitative Reporting and Modeling (3 Credits): In this course, students will learn to engage with large data sets to gain insights into business operations. The course covers managerial, strategic and technical issues. Students will learn to deploy and capitalize on business intelligence and analytics solutions. Students will

learn to focus on KPIs and other models of metrics using dashboards and report cards to communicate insights and progress.

In this course students will learn how to translate data into actionable insights by providing the tools and techniques that can be used for making decisions. The emphasis will be on application and interpretation of results.

ANA 535: Forecasting and Prescriptive Modeling (3 Credits): This advanced statistical modeling course is designed to help students uncover patterns in data, determine variables that have predictive capacity, and develop robust models for predicting business and operational trends. Topics include regression analysis and best practices for selecting and building predictive models.

In this course students will learn how data analytics informs strategy. In doing so the students will gain hands-on experience with data and economic models to optimally utilize information in decision-making.

ANA 540: Advanced Data Analytics. (3 Credits): This course addresses the theory and application of advanced econometric methods, neural networks, deep learning, and machine learning. Students will analyze their own data and interpret reports from other settings.

In this course students will understand the basics of deep learning and their applications in various AI tasks. Students will have experience using computational intelligence and machine learning methods to solve complex analytic problems and develop decision support systems.

ANA 555: Practicum in Applied Analytics, Data Communication, & Ethics (3 Credits): The practicum is designed to help students transition their knowledge and skills from the classroom to their professional setting.

In this course students learn to effectively work in small analytics teams, accelerate the journey from analytics to actions, and deliver an end to end an industry specific project.

Experiential Practica in Data Analytics (0 Credits): The experiential practica are designed for candidates without internship/professional opportunities to gain experiential knowledge and practical experience in Data Analytics. Students will be required to enroll in an experiential practicum with each course they are not either working or participating in an internship related to the program.