APPLIED ANALYTICS (AA)

AA 5000 - Foundations of Analytics
3 Credits
This course is an introduction to the field of Analytics, with an emphasis on its applications in different domains of business and organizational operations. Concepts covered include Data; Information; Knowledge; Big Data and Analytics; Data Governance; Information Visualization and Representation; Evidence-Based Decision-Making; Information Retrieval; and Legal, Ethical and Privacy-related issues associated with Analytics.

AA 5050 - Programming & Problem Solving
3 Credits
This course teaches students how to systematically analyze problems and solve them through computer programming. Students will learn to design, write, and improve code that handles tasks involving data in fields such as analytics, cybersecurity, and information systems. The course focuses on building practical coding skills to create efficient and reliable solutions to problems that can be addressed via programming.
Prerequisite(s): AA 5000
Restrictions:
Enrollment limited to students in the Schl for Professional Studies college.

AA 5100 - Information Retrieval
3 Credits
This course provides a foundation in retrieval of information from different types of data sources, such as Relational Database Management Systems (RDBMSS); Key-Value Data Stores; and Semi-Structured and Unstructured Text. Students develop the key competencies necessary for designing data structures associated with each of the above—mentioned data sources and in accessing data stored in those sources. The primary areas of emphasis will be RDBMSS and Structured Query Language. Key-value data stores and data—stores for storing unstructured data will be introduced and the problem areas where they are applicable will explained and contrasted with those involving RDBMSS.

AA 5200 - Visualization, Feedback and Dissemination
3 Credits
This course will expose students to visualization and presentation techniques designed for the interpretation of data, improved comprehension, communication, and decision making. Students will use current software tools to analyze data, design interfaces and create interactive visualization and presentation applications. Topics will include data and image models, design and evaluation of reporting structures, amps and mapping, document collections, object interaction, feedback processes, and scientific and business simulations.

AA 5221 - Applied Analytics & Methods I
3 Credits
This course focuses on the elements of research design and descriptive statistics. Topics include different types of research designs, probability theory, reliability and validity, and basic descriptive statistics. At the conclusion of this course, students will understand the basics of research design and how to conduct basic data cleaning and descriptive statistical analyses.
Attributes: Aviation Elective (Graduate), Aviation Research (Graduate)

AA 5222 - Applied Analytics & Methods II: Survey Approaches
3 Credits
This course expands on AA 5221 Applied Analytics & Methods I by focusing on (1) the development of a data collection strategy that can be employed in applied survey research and (2) the utilization of inferential statistics most relevant to applied survey research, such as multiple linear regression. Students will also learn to become better consumers of research that utilizes more advanced statistical techniques such as mediation, moderation, and path analysis.
Prerequisite(s): AA 5221 with a grade of C or higher

AA 5223 - Applied Analytics & Methods II: Experimental Approaches
3 Credits
This course expands on AA 5221 Applied Analytics & Methods I by focusing on (1) the development of a data collection strategy that can be employed in applied experimental and quasi-experimental research and (2) the utilization of inferential statistics most relevant to applied experimental and quasi-experimental designs, such as analysis of variance. Students will also learn to become better consumers of research that utilizes more advanced statistical techniques such as discriminant function analysis and repeated measures ANOVAs.
Prerequisite(s): AA 5221 with a grade of C or higher

AA 5250 - Project Management
3 Credits
This course introduces students to the processes involved with managing a corporate level project from its beginning through implementation and ongoing maintenance. The course will cover current project management methodologies and processes, which include plan assessment, strategy formulation, implementation, quality control, and administration. In addition, the student will develop and review project plans from a corporate level project. The goal of the class is for the student to be able to understand and communicate the basics of managing projects, as well as the competitive advantage these projects bring within the business and industry.

AA 5300 - Advanced Analytics
3 Credits
This course covers several commonly-used advanced analytical methods involving statistical learning. Applications of these methods on datasets drawn from several fields will be emphasized, alongside a coverage of visualizations of data and results. Students will also learn how to automate tasks in various phases statistical analyses, and in creating useful visualizations of data and results. (Offered as needed)
Prerequisite(s): AA 5000; (AA 5222 or AA 5223)

AA 5750 - Contemporary Issues in Analytics
3 Credits
This course is a survey of recent technological advances in the area of Analytics. Theoretical foundations of the concepts and their applications in specific business and organizational domains are emphasized. Students will be introduced to specific Analytics techniques that are used currently by practitioners: Predictive Modeling; Data Mining; Marketing Analytics; Web Analytics; Risk Analytics; Text Analytics; and Academic and Learning Analytics.
Prerequisite(s): AA 5000; (AA 5222 or AA 5223)

AA 5800 - Simulation and Modeling
3 Credits
Students will learn concepts drawn from probability, statistical modeling, bootstrapping, design of computational experiments, and sensitivity analysis of models outputs and their application in evidence-based decision-making. Additionally, students will learn techniques for creating and executing simulation models efficiently using appropriate scripting/programming techniques. Students will apply these concepts for addressing problems drawn from a diverse set of organizational and social situations.
Prerequisite(s): AA 5200 and AA 5222

AA 5850 - Advanced Cloud Computing Architectures and Applications
3 Credits
This course examines advanced cloud computing architectures and their applications in three critical domains: cloud-based analytics, cybersecurity, and cloud-native application development and deployment. Students will explore key architectural concepts in the areas of scalability, elasticity, fault tolerance, and their significance in various cloud service models such Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). The course emphasizes designing and implementing solutions to address security challenges, developing and deploying applications using cloud-native methodologies, by utilizing technologies from industry-leading providers.
Prerequisite(s): CYBR 5240 and IS 5800

AA 5900 - Applied Analytics Project I
3 Credits
The goal of the Applied Analytics Project I is to prepare students in the design of an applied research project within an organizational setting. Students will revisit competencies emphasized in the Applied Analytics program and reflect on the ways in which they have developed themselves within those competency areas. Specific attention will be paid to strengths and weaknesses of the student and to opportunities for programmatic improvement.
Prerequisite(s): AA 5100; AA 5200; AA 5250; ORLD 5020; ORLD 5030
Restrictions:
Enrollment limited to students in the Graduate Education college.

Attributes: Prof. Studies Students Only

AA 5910 - Internship Experience in Applied Analytics
1-3 Credits (Repeatable up to 3 credits)
This course provides students with an opportunity to complete an internship that requires them to apply the concepts and skills learned in their specific program of study. Prior to registration, students intending to complete this course are expected to have a formal letter from the organization providing details of the work expected from the student during the 8-weeks that constitute the length of the internship. The letter must be signed by an individual with appropriate authority from the organization sponsoring the internship. In addition, the internship is subject to approval by the program director who will assess the alignment between.
Attributes: Special Approval Required

AA 5930 - Special Topics
3 Credits (Repeatable for credit)

AA 5950 - Applied Analytics Project II
3 Credits
The goal of the Applied Analytics Project II is for students to use the skills they acquired during the Applied Analytics program to analyze and implement the plan for an applied research project that they have proposed in IF 590. The outcome of this course will be a pilot project, a proof-of-concept, or prototype that has the potential to affect and/or promote knowledge discovery and dissemination in an organizational context.
Attributes: Prof. Studies Students Only

AA 5960 - Masters Research Project
3 Credits
The Master's Research Project (MRP) emphasizes a synthesis and demonstration of the competencies gained during a student's time in the MS Analytics program.

AA 5961 - Applied Analytics Master's Project - I
1 Credit
This is the first course in a three-part sequence of courses that together require students to design and implement a master's research project in analytics, demonstrating their mastery of the knowledge and skills they have acquired over their course of study in the MS Applied Analytics program. At the end of this credit hour, students will have identified an organizational problem that can be addressed through analytics, defined the problem unambiguously and rigorously, and provide a report on the appropriate research and context for the problem and its potential set of solutions. Permission must be granted by the program director. Offered annually.
Prerequisite(s): Minimum Earned Credits of 6
Restrictions:
Enrollment limited to students in the Schl for Professional Studies college.

AA 5962 - Applied Analytics Master's Project - II
1 Credit
This is the second course in a three-part sequence of courses that together require students to design and implement a master's research project in analytics, demonstrating their mastery of the knowledge and skills they have acquired over their course of study in the MS Applied Analytics program. At the end of this credit hour, students will have created a research design and its associated implementation plan for addressing the organizational problem that was identified and described in AA 5961. Permission must be granted by the program director.
Prerequisite(s): AA 5961
Restrictions:
Enrollment limited to students in the Schl for Professional Studies college.

AA 5963 - Applied Analytics Master's Project - III
1 Credit
This is the third and final course in a three-part sequence of courses that together require students to design and implement a master's research project in analytics, demonstrating their mastery of the knowledge and skills they have acquired over their course of study in the MS Applied Analytics program. At the end of this credit hour, students will have implemented an analytics project to address an organizational problem, written a formal report using a structure that is appropriate for decision-makers who will benefit from the result of the project implementation, and produced a reflection report of their (students') experiences in implementing their projects and its implications for their future. Permission must be granted by the program director.
Prerequisite(s): AA 5962
Restrictions:
Enrollment limited to students in the Schl for Professional Studies college.

AA 5980 - Graduate Independent Study in Applied Analytics
1 or 3 Credits (Repeatable for credit)