APPLIED ANALYTICS (AA)

AA 5000 - Foundations of Analytics
3 Credits
Covers foundational concepts and practical skills in analytics and artificial intelligence. Students explore data management, analysis, and visualization while learning how to prepare, interpret, and present data-driven insights. The course emphasizes the full analytics pipeline, from exploration to communication of results, and introduces core principles of applied artificial intelligence (AI). Case projects provide hands-on experience and establish a strong foundation for advanced study in analytics and applied AI.

AA 5011 - Foundations of Applied Artificial Intelligence & Machine Learning
3 Credits
Develops practical skills in machine learning and applied AI, including key methods such as supervised and unsupervised learning, neural networks, and generative models. Students implement and evaluate models, apply feature engineering, and interpret AI results for business use. The course highlights how AI can support or limit decision-making in organizations, using applications and case studies for context.
Prerequisite(s): AA 5000* with a grade of C or higher

* Concurrent enrollment allowed.

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.
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 5110 - Data Infrastructure Engineering and Management
3 Credits
Covers the architecture and management of large-scale data systems, including data lakes, warehouses, distributed platforms, and cloud services. Students learn data engineering principles as well as security, privacy, and compliance for organizational analytics. Hands-on exercises focus on automating pipelines and ensuring scalable, reliable data access for AI-driven tools.
Prerequisite(s): AA 5050 with a grade of C or higher

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

* Concurrent enrollment allowed.

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

* Concurrent enrollment allowed.

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 5310 - Predictive Causality & Forecasting Analytics
3 Credits
This course covers methods for identifying causal relationships and developing forecasts to inform decision-making. Students design and implement causal models, evaluate intervention impacts, and use time series and machine learning techniques for forecasting. The course emphasizes application to organizational datasets to support scenario analysis and planning. Through hands-on projects, students connect statistical approaches to practical analytics for organizational context-driven tools.
Prerequisite(s): AA 5221* with a grade of C or higher; AA 5011 with a grade of C or higher

* Concurrent enrollment allowed.

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 5751 - AI and Analytics Product Design
3 Credits
Explores human-centered design principles for AI-powered decision tools, covering UX/UI, prototyping, usability testing, and iterative development. Students learn to design and refine dynamic interfaces that make AI analytics accessible, understandable, and useful for business end-users. Collaborative projects move from ideation through deployment, integrating design thinking practices into technical solution-building. Students build product prototypes using appropriate local and cloud-based AI and analytics technologies.
Prerequisite(s): AA 5011 with a grade of C or higher; AA 5050 with a grade of C or higher

AA 5760 - AI Integration Strategy and Implementation
3 Credits
Students learn how to analyze organizational operations, determine where AI and analytics add value, and design tailored solutions. Learners develop implementation plans, by mapping process changes and required technical training for integration. The course guides students in defining success criteria and milestone-based rollouts to ensure measurable value. Through real-world cases, students bridge technical solutions with organizational strategy for enterprise-wide AI adoption.
Prerequisite(s): AA 5011 with a grade of C or higher

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 5221* with a grade of C or higher; AA 5011 with a grade of C or higher

* Concurrent enrollment allowed.

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