Data Analytics (DA) Courses

DA 6213. Data-Driven Decision Making and Design. (3-0) 3 Credit Hours.
This course familiarizes students with basic scientific processes and formalisms, such as question formulation and hypothesis development. Students will be provided the opportunity to gain an understanding of how formulated questions and hypotheses can lead to data collection and analysis, as well as how data itself can be explored and summarized to generate such questions and hypotheses. The course also introduces students to foundational data analytics processes, such as the data-to-decision processes, data handling processes, and data analysis processes. Data provenance for data-to-decision traceability and critical scientific documentation principles important to scientific and analytic functions is also discussed.

DA 6223. Data Analytics Tools and Techniques. (3-0) 3 Credit Hours.
Students will be provided the opportunity to gain education and experience with common tools and techniques used in a variety of data analytics application areas. Students will become familiar with database technology and leading commercial and open source analytics platforms. Students will also be provided the opportunity to learn how to use these technologies and platforms to solve data analytics problems by obtaining a basic understanding of database querying and basic scripting in analytics platforms. Students will not become scientific programmers from this course, nor will they learn the formalisms of programming per se; rather, they will be provided the opportunity to learn and experience how to develop functional scripts and leverage existing analytics libraries to solve data analytics problems using software.

DA 6233. Data Analytics Visualization and Communication. (3-0) 3 Credit Hours.
Since the purpose data analytics is to inform and facilitate better data-driven decisions, and transform data to information and knowledge, the ability to effectively communicate data aggregations, summarizations, and analytic findings to decision makers is very important. The ability to communicate highly complex analyses and scientific findings to a non-technical audience is challenging. This course will educate students on common mistakes and success factors in technical communication, and give them experience communicating findings orally and in writing. The course will also focus heavily on data analytics visualization approaches and tools. Students will be provided the opportunity to learn common methods for data visualization for a wide variety of data types and data analytics applications.

DA 6813. Data Analytics Applications. (3-0) 3 Credit Hours.
Students will be presented a big picture understanding of data analytics, including its purpose, common benefits and challenges, important analytic processes, and what is needed to perform data analytics, such as skills, tools, technology, etc. Students will be introduced to a wide variety of data analytics applications in a wide variety of fields, such as information technology, cyber security, bioinformatics, biomedical/health, insurance and risk, finance, economics, accounting, business intelligence, crime and fraud detection, marking and customer analytics, energy and environmental, manufacturing and operations, and logistics and supply chain. Data analytics applications will be demonstrated through case-based study and guest lectures from data analytics experts and managers in the various application areas listed above.

DA 6823. Data Analytics Practicum I. (3-0) 3 Credit Hours.
Prerequisites: DA 6213, DA 6813, and STA 6443. This course presents students with the practical knowledge, skills, and experience needed to conduct real-world, high-quality data analytics in an application area of interest. Students will meet formally with their peers and the instructor for the purpose of facilitating the practicum experience. Students will simultaneously engage in formal internships and regular meetings with key members of the organizations hosting and facilitating student practicum project(s). During this practicum, students will engage in the following steps of the data analytics process: problem defining, question formulation, hypothesis development, preliminary analytics, analytical design, data acquisition, data preparation and pre-processing, and initial data analysis.

DA 6833. Data Analytics Practicum II. (3-0) 3 Credit Hours.
Prerequisite: DA 6823. This course continues the practicum experience in the same manner as Data Analytics Practicum I. Students will continue and finish their major data analytics project, focusing on the analysis and presentation of results portion of the process. The next steps will be detailed data analysis, conclusion drawing, report preparation and refinement, presentation preparation and final presentation. The practicum will culminate in a formal, completed report to the supporting organization, as well as to data analytics peers and professors. Students who earn a grade of "B" (3.0) or better in this course will satisfy the comprehensive examination requirement. A student who receives a grade of "B-," "C+," or "C" may still satisfy this requirement by successfully passing a comprehensive examination as set out in this catalog.