



Module Descriptions

Descriptive Analytics The goal of this course is to help students learn a variety of statistical tools useful in summarizing past events and information. Students will learn how to transform raw data into descriptive summaries that can be easily presented and understood. The course will cover Aggregate Analysis, Correlation, Trends, and Distributions (normal, binomial, chi-square, etc.). Confidence Intervals, Hypothesis Testing, and Sampling (one sample, two sample, many samples, etc.), and Sample Sizing will also be explored, with the goal of enhancing the student's ability to convey statistical information to others. The conclusion of the course will include an introduction to Estimation (including bias and error), and Simple Linear Regression.

Business Intelligence In today's highly-competitive business landscape, it is crucial that an organization makes sense of the sea of data in which it operates. Raw transactional data acquired from both structured and unstructured sources must be vetted, categorized, enhanced, stored, secured and ultimately transformed into organizational knowledge. This is only accomplished if the integrity of the information is ensured and that the information is properly used. This survey course provides an overview of the concepts, processes and technologies necessary to provide decision-makers with actionable intelligence to make good decisions and understand the drivers of their Key Performance Indicators (KPIs). Consideration will be given to both tactical and strategic intelligence with special emphasis on environmental requirements including data governance, regulatory compliance and ethics.

Predictive Analytics The goal of this course is to explore a variety of statistical techniques useful in making predictions about future events. The culmination of the course will lead students to employ predictive analytics to assist in decision making and transforming statistics into useful prescriptive analytics. The course will cover Data Analysis (simple visualization, graphing, etc.) and Model Building. Statistical models will include Simple Linear & Multiple Linear Regression Analysis consisting of an examination of dummy variables, Non-Linear Regression, residual analysis, multicollinearity, and forecasting. Additional models including Logit & Probit Regression, Poisson Regression, Ordinal Regression, Survival Analysis (time to event and hazard rate), Data Segmentation (k-means clustering), and Time Series Analysis will also be utilized as predictive techniques. Emerging concepts of machine learning and cognitive analytics will be explored. The emerging topics of Autoregressive Models (AR & ARMA) and Regression Trees will also be explored.

Data Warehousing and Mining: Technology has become integral to our lives and as crucial to modern society as the most basic utilities. As a result, data is being generated at an unprecedented rate, and for an organization to compete, it must make sense of it. This course will take an information technology approach to examining the theory, concepts and technologies required to transform data into actionable intelligence in support of decision-making. The warehousing and mining of data represent two ends of a symbiotic process and are examined in detail, from data extraction, transformation and loading to the establishment of an appropriate mining architecture, algorithm and technique. A variety of current tools and technologies will be reviewed and evaluated. The unique challenges presented by "Big Data" will be explored in this course.

Data Visualization: In the world of big data, there is a need to "tell the story" clearly and efficiently with the goal of influencing decisions. The data behind the story can represent customer behaviors, healthcare trends, or research findings. The ability to organize and present data in an understandable, visual, and coherent manner is an essential skill required in today's world. This course teaches the student to explore innovative techniques to display data in an effective and compelling analysis of past performance, current state, and project future trends. It also incorporates the soft skills that are necessary to influence decision makers. Data visualization methods allows for the communication of the message using aesthetically pleasing charts, graphs and diagrams featuring various mediums of color, line boldness and shape orientation. The student will learn and use a mix of statistics, data mining, and visual/graphic design skills with an introduction to several of the most popular tools.

Data Analytics Capstone: The individual/ small team will utilize knowledge gained from the previous course modules to provide actionable information for decision makers to enhance an organization's effectiveness. The topic chosen may be an "existing real" topic or use data sets from open source data repositories. The process will scope the project, formalize a question, locate data sources, determine the method of analysis, implement analytical procedures, visualize and communicate the results of the organizational issue. This process will help students integrate what they have learned over multiple courses.