

# DATA VISUALIZATION (DATA1-CE)

## DATA1-CE 8998 Healthcare Analytics (2 Credits)

The capacity to make clinical decisions in the face of growing volumes of complex, heterogeneous data will increasingly rely upon new analytical methods. This course aids the working professional in learning effective data analysis techniques that can be applied in the medical workplace. Gain the practical knowledge required to analyze data, develop connections among data, and explore opportunities for improvements. Statistical analyses and data mining techniques will be discussed, along with methods for deploying these techniques using R, the open-access analytical software. Upon successful completion of the course, you will have a better understanding of the nature of big data and the methods used for acquiring, analyzing, and ultimately discovering new information from it. This course is ideal for anyone interested in a deeper understanding of the emerging fields of personalized medicine, data science, and healthcare analytics, as well as their impact on healthcare.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

## DATA1-CE 9000 Visual Analytics with Tableau (2.5 Credits)

The ability to characterize and communicate practical implications of quantitative analyses to any kind of audience member is the hallmark of great data analysts. The richest data is useless to any enterprise if it fails to result in actionable advice, or if the advice does not convey solutions and directions in a way that all stakeholders can understand. Learn how to become a master at communicating business-relevant implications of data analyses using Tableau, the industry-leading software that provides reliable, flexible, and repeatable methods for analyzing real-world data. This course investigates visual analytics and related concepts with Tableau through the completion of real-world case studies. Learn in detail how to use Tableau's platform for visual analysis and business intelligence, which will help you to see and understand data like never before. Acquire the skills in Tableau to connect to multiple data sources, enhance them, and display them using visual analysis techniques.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

## DATA1-CE 9001 Managing Data for Visualization (2.5 Credits)

Explore the techniques and tools used to organize data into manageable and logical components for analysis and visualization. Gain an overview of the multiple ways in which data is managed, with particular focus on five topics: sourcing, comprehension, reshaping, reduction, and presentation. Receive an introduction to these various methods so you can pursue your own interests in creating data sets that are accurate, valid, and complete. Topics include Excel, delimited files, HTML tables, SQL, and specialized databases.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

## DATA1-CE 9002 The Art of Data Visualization (2.5 Credits)

Data visualization is storytelling in a graphical medium. The course covers the six basic principles of data visualization: telling a story, making a good sign, fulfilling a business purpose, incorporating human perception, using color and streamlining, and selecting the appropriate chart format. In this course, gain knowledge by doing and redoing, by offering and receiving critique, and above all, by learning from each other. This class is intended to develop a discriminating eye for good visualizations.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

## DATA1-CE 9003 Analytics and Data Visualization for Content Marketing (0 Credits)

Content marketers use many forms of media to attract customers, and they rely on text and graphics to convey statistics, information, concepts, strategies, metaphors, and compounds. Analytics and data visualization are powerful assets that offer new methods for tracking consumer behavior and for providing direct, convenient marketing solutions. By completing a specific marketing-related project, learn to generate, analyze, and communicate through data-driven design. The focus of this hands-on course is using data analysis tools, computer-assisted reporting, data visualization techniques, GIS data, and other tactics to conceptualize, research, and produce this industry-applied project. Whether your aim is to understand marketing metrics and performance, to uncover trends and insights, or to address a particular product, learn how best to use these skills to accomplish your goals to reach your customers.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

## DATA1-CE 9004 Statistical Foundations of Data Visualization (2.5 Credits)

Data visualization has been recognized as a core competency of statisticians since the time of John Tukey in the 1970s. This course covers the essentials of the statistical foundations of visualizing data. Learn the systems involved in processing and transforming data with the goal of creating useful information for decision-making, interpretation, and visualization. Using statistical tools, gain an understanding of how to interpret data quantitatively and to explore data-oriented structures. The primary focus is on descriptive statistics used to present and summarize numerical information.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

## DATA1-CE 9005 Introduction to Data Visualization (0 Credits)

Data visualization is the process used to communicate information clearly in graphical form. Gain an overview of the concepts and models used to visualize data with a focus on trends in the fields of business, journalism, and graphic design. Examine data visualization projects and learn how these projects integrate statistical analysis, computer science, and graphic design.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

**DATA1-CE 9006 Data Visualization for Business (2.5 Credits)**

Accurate and effective analysis of data is crucial for informing decision-making in today's business environment. Increasingly, professionals across sectors and departments need to possess the tools to gather, disseminate, visualize, and communicate data-based information. In this hands-on course focused on a practical project, learn to generate, analyze, and communicate data for a specific business-related project. Focus on using data analysis tools; computer-assisted reporting; data visualization techniques; GIS data; and other tactics to conceptualize, research, and produce the project. Whether your aim is to understand business metrics and performance; to uncover trends and insights; or to address cost, productivity, and functionality, discover how to best use these skills to accomplish your purpose.

Registering at least three weeks prior to the course start date is highly recommended.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

**DATA1-CE 9007 Trials of Superman and Friends: Copyright and Trademark Law (2 Credits)**

Is a bird, it's a plane, it's a...law course? Yes, a law course using that strange visitor from another planet to help explain copyright and trademark law. Superman turned 75 last year, and we will look at his history, and how his name and likeness, and those of other superheroes, have been used and litigated through the decades. Explore copyright infringement, trademark matters, copyright reversion, and other issues that have arisen during the Man of Steel's career. We'll also read comics and watch some cartoons. Faster than a speeding bullet? Sure. Able to leap tall buildings in a single bound? Absolutely. But when it comes to protecting intellectual property, it is the judge who has the final say.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

**DATA1-CE 9008 Presentation Techniques for Data (1 Credit)**

An analyst provides information, a strategist provides insight. In this hands-on, personalized workshop, improve your data presentation skills to move beyond analysis to thought partnership and strategic leadership. Using proven communications tools and methods, you will build upon your own unique strengths to organize and synthesize information, analyze audiences, and deliver keener, more useful insights with significantly more impact. Using video review and counsel from instructors and classmates, sharpen your skills to become more persuasive at the front of the room, no matter how skilled you were at the start. Each session includes exercises, video examples, and assignments to help you to organize ideas more quickly, discover your most potent communication techniques, and gain the confidence you need to share ideas and lead productive discussions with grace.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

**DATA1-CE 9009 Data Mining, Predictive Analytics, and Big Data (2 Credits)**

The collection, analysis, and visualization of complex data play critical roles in research, business, and government. Powerful tools from applied statistics, mathematics, and computational science can be used to uncover the meaning behind complex data sets. Gain an overview of the relevant pivotal concepts and explore in depth specific areas of statistics and analytic techniques that allow you to provide data summarization (e.g., through visualization), to identify important patterns and trends, and to apply practical skills and a theoretical basis for approaching challenging data analysis problems. Big data and analytics are crucial to data visualization, as big-data insights and predictions are more easily understood when presented in visual form.

Registering at least three weeks prior to the course start date is highly recommended.

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**Repeatable for additional credit:** Yes

**DATA1-CE 9010 Interactive Data Visualization (2.5 Credits)**

How can we transform data into compelling and meaningful visuals and use visualization to tell stories and show patterns from data sets? Learn the basic steps of visualizing data, from spreadsheets to visual representations. Case studies are presented and examined through a technical and conceptual lens. Using programming, experiment with a wide range of visual approaches and create your own custom visualizations. Projects focus on creating interactive systems and interfaces that allow users to explore different layers and views.

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**Repeatable for additional credit:** Yes

**DATA1-CE 9011 Advanced Tools for Data Visualization (1.5 Credits)**

Because visual discovery and the ability to make data analysis easier are in great demand, there is a constant stream of new tools available for data presentation. But what is the difference between "advanced" data visualization and the routine charts and graphs of Excel or PowerPoint? Traditional reports using tabs, rows, and columns do not paint the whole picture, which can lead an analyst to the wrong conclusion. Advanced data visualization encompasses practices such as geospatial visualization, dynamic data, visual querying, linked multidimensional visualization, animation, personalization, and actionable alerts. Explore industry-leading software tools from IBM, Information Builders, SAP, SAS, Tableau, Tibco, and Oracle in tandem with lectures that introduce new concepts and strategies for solving large data visualization problems.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes

**DATA1-CE 9012 Data Visualization Intensive (4 Credits)**

Data is the new oil, and visualization of that data, if done right, has the ability to tell a story through images, directing users toward conclusions about data and empowering them to make better decisions. Throughout your professional career, you will be required to gather, analyze, and share vast amounts of data. Gathering data is usually the easy part. Making sense of that data, drawing valid conclusions, and clearly presenting findings to your colleagues are the challenges. In this intensive course, real-world problems that require visualization will be demonstrated, and you will work through the process of visualizing this data and gaining insight. The intensive kicks off with an introduction to visualization, followed by best practices when dealing with diverse data (abstract and spatial), demonstrations of a variety of methods and techniques on those data sets, and a presentation of a range of freely available software. Become familiar with the principles of graphical perception and the visual encoding of quantitative information. Learn how to use these principles to evaluate an effective visualization. Explore what makes graphical representations of data successful or unsuccessful, and gain an appreciation of the different goals of visualization. This intensive has both a theoretical component that covers the main rules of the discipline and a practical one: the design of striking, informative, and powerful infographics and models for visualization.

**Grading:** SPS Non-Credit Graded

**Repeatable for additional credit:** Yes