Data Analytics Certificate

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Courses

CAPS - DATASTUDIES 1240 Introduction to (Statistical) Programming With R

In this online course, students learn how to work with data using the R package. R is a computer language that is often used for statistical analysis and computations. This course will include a short introduction to terms and concepts from descriptive statistics (mean, median and frequency, for example), but this is not a statistics course. No prior programming or statistics is required, although both/either would be helpful. Prereq(s): College algebra.
Credit 3 units.

Typical periods offered: Summer

CAPS - DATASTUDIES 1335 Programming With Python

An introduction to programming in Python. Topics include the software development process, documentation, debugging, and testing within the commonly used Python environment. Students learn to recognize patterns and develop strategies for solving programming tasks. At the end of the course, students should be able to write and debug basic programs to display and interpret data using accepted programming conventions and styles. Note: an understanding of high school algebra is assumed. Students with no prior programming experience may need to spend additional time on assignments.
Credit 3 units.

Typical periods offered: Summer 4, Summer 3, Summer 2, Summer 1, Summer, Spring, Fall

CAPS - DATASTUDIES 1400 Data Fundamentals I

Data Fundamentals I is the first part of two-part course series that provides a foundation in integral data concepts such as data literacy, data management, data preparation, data analysis, foundational statistical concepts, and communicating with data. This course is designed for students who have little to no background in data foundations or would like a refresher on foundational data concepts.
Credit 1.5 units.

Typical periods offered: Summer 4, Summer 3, Summer 2, Summer 1, Summer, Spring, Fall

CAPS - DATASTUDIES 1450 Data Fundamentals II

Data Fundamentals II is the second part of a two-part course series that provides a foundation in integral data concepts such two- and three-dimensional data visualization and an overview of geospatial data. This course is designed for students who have little to no background in data foundations or would like a refresher on foundational data concepts. Since this course builds upon the concepts in Data Fundamentals I, it is required that students take this course prior to enrolling in this course or have prior knowledge of the concepts discussed in Data Fundamentals I.

Credit 1.5 units.
Typical periods offered: Summer 4, Summer 3, Summer 2, Summer 1, Summer, Spring, Fall

CAPS - DATASTUDIES 2006 Data Analysis and Visualization in Tableau

In this course, students will create interactive visualizations in order to gain meaningful insights about a dataset. Students will learn the basic functions of Tableau, including filtering, sorting, formatting common chart types, and visualization aesthetics. Advanced topics will include dashboard actions, calculation functions, and parameters. Students will also learn to explore, dissect, and reproduce existing visualizations created by Tableau experts. A variety of datasets will be provided but students will also have the opportunity to bring in their own datasets for analysis. This course is ideal for students who have an understanding of descriptive statistics and have analyzed datasets using other data tools (Excel, R, SPSS, SAS, etc.).
Credit 3 units.

Typical periods offered: Fall, Spring

CAPS - DATASTUDIES 2024 Advanced Data Visualization (with R)

Visual representations of data are important for conveying complex information simply. There are many packages available in R (such as ggplot2) that can be used to generate plots and graphs of various kinds. Sometimes the default output from a particular command is not the best way to communicate a particular result or trend. This course will help students to learn more about the common ways to display data, as well as how to make changes to the codes so that the visualizations are more effective. Visualization techniques involve study from areas such as graphic design, computer science, psychology, and mathematics. Topics include: categorical data, distributions, time series, scatter plots, and maps.
Credit 3 units.

Typical periods offered: Summer 4, Summer 3, Summer 2, Summer 1, Summer, Spring, Fall

CAPS - DATASTUDIES 2031 Introduction to Data Science With Python

A continuation of Programming with Python, students apply their skills to data science examples. The course will start with a brief review of Python and then shift to technical topics such as working with the numerical library NumPy; data manipulation with pandas; and creating graphics with matplotlib, Seaborn and other data visualization libraries. The final project will be an application of machine learning using the scikit-learn library. Prerequisites: U20 133 or permission of the instructor
Credit 3 units. UColl: NSC

Typical periods offered: Spring

CAPS - DATASTUDIES 2115 SQL and Data: Exploration and Analysis

This course is designed to provide students with a basic understanding of common tools needed to explore and analyze data and to create actionable information. Spreadsheets, databases, and a programming language to manipulate data form the foundation of this toolset. While there are many applications available in these three categories, this class will utilize Microsoft Excel, Microsoft Access, and Structured Query Language (SQL) to understand the fundamentals. By the end of this course, students should be familiar using spreadsheets and databases for data queries, analysis, and visualization. Any basic statistics required for the class will be covered. No prerequisites, but college algebra, plus basic knowledge in spreadsheets, would be helpful (but not necessary).
Credit 3 units.

Typical periods offered: Summer 4, Summer 3, Summer 2, Summer 1, Summer, Spring, Fall

CAPS - DATASTUDIES 2240 Advanced Data Visualization (with R)
Visual representations of data are important for conveying complex information simply. There are many packages available in R (such as ggplot2) that can be used to generate plots and graphs of various kinds. Sometimes the default output from a particular command is not the best way to communicate a particular result or trend. This course will help students to learn more about the common ways to display data, as well as how to make changes to the codes so that the visualizations are more effective. Visualization techniques involve study from areas such as graphic design, computer science, psychology, and mathematics. Topics include: categorical data, distributions, time series, scatter plots, and maps.
Credit 3 units.

Typical periods offered: Summer 3, Spring, Fall, Summer

CAPS - DATASTUDIES 3250 Communicating, Leading, and Problem Solving With Data
Some of the most desired skills in the job market, across various fields, are management, communication, leadership, and the ability to apply data to influence policy and decision-making in an organization. The purpose of this course is to help students develop the non-technical skills needed to use data in various professional settings such as concepts in data literacy, data interpretation, and data communication. Students will be able to apply the knowledge they learned through mini-assignments, weekly discussions, and a semester long-project that is divided into stages.
Credit 3 units.

CAPS - DATASTUDIES 4001 Foundations of Programming for Data Analytics & Applications
Programming is an increasingly important skill, whether you aspire to a career in software development or in other fields. This course introduces core programming concepts and problem-solving using Python. Students will learn the principles of software development, style, and testing. Topics include an operational model of Python execution, procedures and functions, iteration, recursion, lists, strings, algorithms, exceptions, object-oriented programming, and GUIs (graphical user interfaces). As the course progresses, students will learn to work with packages, data structures, object-oriented programming, and tools for data science and cybersecurity.
Credit 3 units.

Typical periods offered: Summer 3, Spring, Fall, Summer

CAPS - DATASTUDIES 4002 Foundations of Mathematics for Data Analytics & Applications
This course introduces the fundamental concepts, theorems, and tools used in data science and machine learning, including probability, optimization and calculus, linear algebra, discrete mathematics, and statistics. Applications of the theory to data science and machine learning will be developed with mathematical concepts being applied in Python.
Credit 3 units.

Typical periods offered: Summer 3, Spring, Fall, Summer

CAPS - DATASTUDIES 4050 Experiential Learning in Data Analytics
This course is designed to provide students with direct experience in applying data concepts to a semester-long independent project. Students may apply concepts and tools covered throughout their coursework in the Data Analytics Certificate program. They have a choice of either doing data work for a client or doing an independent project on a subject of their choosing. Students must have completed all coursework for the Data Analytics certificate with the exception of Communicating, Leading, and Problem Solving with Data (U71 DATA 3250), which they can take concurrently with this course.
Credit 3 units.

Typical periods offered: Summer 4, Summer 3, Summer 2, Summer 1, Summer, Spring, Fall