COURSE SYLLABUS

Data Analytics Certificate Online

Master the key skills required to become a Data Analyst or Business Analyst, including data analysis, data visualization, and statistical techniques. Gain hands-on experience through real-world projects and get ready for a successful career in data analytics.

> Group classes (Live Online) and onsite training are available for this course. For more information, email partnerships@vdci.edu or visit: https://vdci.edu/certificates/data-analytics-certificate-online



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Course Outline

This package includes these courses

- Excel for Data Analytics Course Online (18 Hours)
- Data Analytics Foundations Course Online (12 Hours)
- Python for Data Science Course Online (30 Hours)
- SQL Course Online (18 Hours)
- Python for Automation Course Online (6 Hours)
- Python Data Visualization & Interactive Dashboards Course Online (24 Hours)
- Python Machine Learning Course Online (30 Hours)
- Tableau Course Online (12 Hours)
- Data Science Capstone Project (18 Hours)

Attend the Python for AI Course or Power BI Bootcamp for free as part of this certificate. Choose your date after you register for the program.

- Python for AI Course Online
- Power BI Course Online

Excel for Data Analytics Course Online

Master Excel's most powerful features to streamline data analysis, improve reporting accuracy, and extract meaningful insights from large datasets in this hands-on training.

- Learn Excel functions and formulas for organizing, calculating, and summarizing data efficiently
- Create and customize visual charts, including line, column, and pie charts to present data clearly
- Use logical statements, database functions, and data validation to manage and filter large datasets
- Build and manipulate Pivot Tables to quickly summarize, sort, and group information
- Explore advanced tools like named ranges, date calculations, and macro recording for custom reporting
- Apply auditing techniques, cell locking, and Excel hot keys to optimize your spreadsheet workflow

Data Analytics Foundations Course Online

Gain hands-on experience in statistical concepts, forecasting techniques, and data modeling methods that are widely used across industries to drive smarter decision-making.

- Understand core statistical concepts such as measures of central tendency, data dispersion, and the normal curve
- Explore descriptive and inferential statistics, including probability distributions like binomial and Poisson
- Learn to analyze and forecast data using correlation, linear regression, and multiple regression techniques
- Apply predictive analytics with tools such as trendlines, moving averages, and scenario modeling
- Create clear data visualizations with charts, histograms, icon sets, color scales, sparklines, and pivot tables
- Discover prescriptive analytics techniques like Solver and linear programming to optimize decision-making

Python for Data Science Course Online

Learn how to use Python as a practical tool for data-driven decision making by building a strong foundation in programming and data analysis. Through hands-on projects with real-world data, you'll practice cleaning and organizing datasets, creating clear visualizations, and applying statistical techniques to uncover meaningful insights.

- Work with various data types, including integers, floats, and strings
- Control program execution using conditional statements, loops, and functions
- Simplify and reuse code with object-oriented programming
- Analyze structured data using NumPy and pandas
- Design graphs and visualizations with Matplotlib
- Build predictive models using linear regression with scikit-learn

SQL Course Online

Learn how to efficiently extract, filter, and manipulate data using SQL with a focus on PostgreSQL fundamentals. This course covers database querying, table joins, and advanced techniques for managing large datasets.

- Write SQL queries to efficiently retrieve, filter, and sort data
- Use joins to combine data from multiple tables and create relationships
- Apply aggregate functions like SUM, COUNT, AVG, and GROUP BY to summarize data
- Work with subqueries, CASE statements, and advanced string functions
- Optimize queries using indexes, data type conversions, and best practices
- Explore views and user-defined functions for streamlined database management

Python for Automation Course Online

Learn how to use Python to extract data from websites and write loops to process multiple pages. This course covers essential topics like HTML/CSS, Python fundamentals, web scraping techniques, data storage, scheduling, and includes real-world examples of scraping valuable data.

- Understand how websites are structured using HTML and CSS to locate and extract specific data
- Build a foundation in Python fundamentals, including variables, data types, conditionals, loops, and working with lists
- Use the Requests and Beautiful Soup libraries to scrape web content and target relevant information
- Write loops to automate data collection across multiple web pages and reduce repetitive manual work
- Save scraped data in common formats such as text files and CSVs for analysis and reporting

- Schedule Python scripts to run automatically, supporting ongoing data collection and automated workflows

Python Data Visualization & Interactive Dashboards Course Online

Learn how to collect, manipulate, and analyze real-world data in this course, gaining hands-on experience with Python's NumPy and pandas libraries. Enhance your data visualization skills with tools like Matplotlib, Seaborn, Plotly, and Dash Enterprise, and work on real-life projects that you can deploy online.

- Plan and present a compelling data narrative
- Collect and manipulate data from various sources
- Discover insights through exploratory data analysis
- Manipulate data using NumPy and pandas
- Utilize advanced Python visualization libraries like Plotly and Dash
- Create interactive dashboards
- Apply best practices in dashboard design for professional data science solutions
- Deploy your project and dashboard live on a server

Python Machine Learning Course Online

Master the basics of machine learning, including regression analysis and classification algorithms, in this hands-on course. Develop the skills required to tackle real-world challenges using machine learning, with an emphasis on Python programming and key data science libraries.

- Clean and balance data using the pandas library
- Implement machine learning algorithms like logistic regression and random forest with scikit-learn
- Select relevant features to input into your algorithms
- Correctly split data into training, test, and cross-validation sets
- Understand key theoretical concepts such as overfitting, variance, and bias
- Assess the performance of your machine learning models

Tableau Course Online

Acquire the skills to transform raw data into impactful visual stories with Tableau, the industry-leading data visualization platform. This self-paced course will guide you in exploring, analyzing, and publishing dashboards that effectively communicate insights.

- Connect to datasets in multiple formats, then clean, filter, and structure the data for effective visual storytelling
- Create various visualizations such as bar charts, line charts, treemaps, heat maps, and dual-axis charts
- Leverage Tableau’s calculation tools to build custom fields, apply aggregates, and enhance your data analysis
- Format charts with labels, tooltips, colors, and axes for improved clarity and visual appeal
- Work with geographic data to create interactive map visualizations, including choropleths and proportional symbol maps
- Customize dashboards and stories for different audiences and devices using Tableau’s interactive features
- Integrate external map services and explore advanced visualization types like spider maps and alluvial diagrams
- Publish your projects to Tableau Cloud and export dashboards for professional sharing and collaboration

Data Science Capstone Project

Throughout this program, you will complete three capstone projects to showcase in your portfolio:

Machine Learning & AI Capstone

- Choose, clean, and engineer features from a structured dataset to train machine learning models (e.g., logistic regression, random forest), evaluate performance, and visualize results clearly.
- Deliver a professional presentation detailing your data processing workflow, modeling techniques, and insights discovered using Python libraries like pandas, scikit-learn, and Matplotlib.

Python for AI Capstone *(choose one of two)*

- AI Chat Assistant: Build an interactive chat assistant embedded on a webpage, using Flask and JavaScript to integrate with OpenAI's API for context-aware user interactions.
- Collectibles Identification App: Develop a Flask-based web app allowing image uploads of collectible items, leveraging OpenAI to identify items, generate descriptive metadata, and dynamically display logged session history.

Python Data Visualization Capstone

- Clean, analyze, and visualize global CO_2 emissions alongside GDP and population data, highlighting trends and correlations through insightful visualizations with Matplotlib, seaborn, and plotly.
- Build a responsive Dash dashboard enabling interactive exploration of emissions data, clearly communicating insights such as regional trends, GDP-emission correlations, and emission anomalies.

You will work on your capstone projects both in and outside of class, using scheduled mentoring sessions to review your progress, ask questions, and get personalized feedback from your instructor.

See examples of data science capstone projects from students.