COURSE SYLLABUS

Data Science & AI Certificate Online (Self-Paced)

Build the skills needed for a career in data science by learning Python, SQL, automation, and machine learning. This beginner-friendly, self-paced program covers Python programming, data analysis, SQL querying, and predictive modeling to help you develop a strong technical foundation. Designed for those new to the field, it prepares you for entry-level data science and Python engineering roles while opening the door to high-paying opportunities in the data science industry.

Group classes (NYC) and onsite training are available for this course. For more information, email corporate@nobledesktop.com or visit: https://www.nobledesktop.com/certificates/data-science-online



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Course Outline

This package includes these courses

- SQL Course Online (Self-Paced) (18 Hours)
- Python for Data Science Course Online (Self-Paced) (30 Hours)
- Python Machine Learning Course Online (Self-Paced) (30 Hours)
- Python for Automation Course Online (Self-Paced) (6 Hours)
- Python Data Visualization & Interactive Dashboards Online (Self-Paced) (24 Hours)
- Data Science Capstone Projects (0 hours)

Attend the Python for AI (Self-Paced) course or the AI for Data Analytics (Self-Paced) course for free as part of this certificate.

- Python for AI Course Online (Self-Paced)
- AI for Data Analytics (Self-Paced)

SQL Course Online (Self-Paced)

Learn how to extract, filter, and manipulate data using SQL. This course covers PostgreSQL fundamentals, database querying, table joins, and advanced techniques for handling large datasets.

- Write SQL queries to retrieve, filter, and sort data efficiently
- Use joins to combine information from multiple tables and establish relationships
- Apply aggregate functions like SUM, COUNT, AVG, and GROUP BY to summarize data
- Work with subqueries, conditional logic (CASE statements), and advanced string functions
- Optimize queries using indexes, data type conversions, and best practices

- Explore views and user-defined functions to streamline database management

Python for Data Science Course Online (Self-Paced)

Unlock the power of Python for data-driven decision-making as you master Python programming fundamentals and dive into data analysis. Acquire essential skills to clean and manipulate data, create insightful visualizations, and perform statistical analysis, all through hands-on projects with real-world datasets.

- Handle different types of data such as integers, floats, and strings
- Control the flow of your programs with conditional statements, loops, and functions
- Reuse and simplify code with object-oriented programming
- Analyze tabular data with NumPy and pandas
- Create graphs and visualizations with Matplotlib
- Make predictions with linear regression, using scikit-learn

Python Machine Learning Course Online (Self-Paced)

Learn the fundamentals of machine learning, including regression analysis and classification algorithms, in this practical, hands-on course. Gain the skills needed to solve real-world problems using machine learning, with a focus on Python programming and data science libraries.

- How to clean and balance your data using the pandas library
- Applying machine learning algorithms such as logistic regression and random forest using the scikit-learn library
- Choosing good features to use as input for your algorithms
- Properly splitting data into training, test and cross-validation sets
- Important theoretical concepts like overfitting, variance and bias
- Evaluating the performance of your machine learning models

Python for Automation Course Online (Self-Paced)

Learn how to use Python to extract data from websites and write loops for processing large numbers of pages. This course covers HTML and CSS, Python fundamentals, web scraping techniques, data storage, and scheduling.

- Learn Python syntax and how to construct programs and scripts
- Write scripts that automate manual tasks and update Excel files automatically
- Identify and correct common errors in your code
- Schedule your programs to run automatically on a regular basis
- Apply web scraping techniques through real-life exercises and examples

Python Data Visualization & Interactive Dashboards Online (Self-Paced)

Learn to gather, manipulate, and analyze real-life data in this course, where you'll gain hands-on experience with Python's NumPy and pandas libraries. Develop your data visualization skills using Matplotlib, Seaborn, Plotly, and Dash Enterprise, and complete real-life projects that can be deployed online.

- Plan, gather, and manipulate data from different sources to present a data story
- Find data stories through exploratory data analysis
- Manipulate data with NumPy and pandas.

- Use advanced Python visualization libraries Plotly and Dash
- Build a dashboard and apply the rules of effective dashboard design to create professional data science solutions
- Go live with your project and deploy the dashboard on a live server

Data Science Capstone Projects

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.