COURSE SYLLABUS

Data Science & AI Certificate

Learn Python, SQL, automation, and machine learning to become a Data Scientist. Gain Python programming, data analysis, SQL querying, and predictive modeling skills. Perfect for beginners, this program prepares you for entry-level data science and Python engineering roles.

> 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



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Course Outline

This package includes these courses

- Python for Data Science Bootcamp (30 Hours)
- SQL Bootcamp (18 Hours)
- Python for Automation (6 Hours)
- Python Data Visualization & Interactive Dashboards (30 Hours)
- Python Machine Learning Bootcamp (30 Hours)
- Data Science Capstone Projects (0 hours)

Attend the Python for AI course for free as part of this certificate. Choose your date after you register for the program.

Python for AI: Create AI Apps with Flask & OpenAI

Python for Data Science Bootcamp

Build a strong foundation in Python programming and data analysis through real-world projects that prepare you for advanced topics like machine learning and predictive modeling.

- Learn Python fundamentals, including variables, data types, functions, loops, and control flow for building robust programs
- Work with complex data structures like dictionaries and lists to efficiently organize and access data
- Use NumPy and pandas to import, clean, and manipulate datasets for analysis and exploration
- Generate descriptive statistics and apply filtering, grouping, and pivoting techniques for deeper insights
- Visualize data with Matplotlib and create clear, customized charts such as bar graphs, histograms, and scatter plots
- Gain the practical skills needed to transition into machine learning with a solid understanding of data science workflows

SQL Bootcamp

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 Automation

Learn how to automate web tasks and extract valuable online data using Python, with practical training in web scraping, data storage, and script scheduling.

- Understand how websites are structured using HTML and CSS to identify elements for data extraction
- Learn Python fundamentals, including variables, data types, conditionals, loops, and list manipulation
- Use the Requests and Beautiful Soup libraries to perform web scraping and target specific content
- Write loops to automate scraping across multiple web pages and streamline repetitive tasks
- Store scraped data in various formats, including text files and CSVs, for analysis and reporting
- Schedule Python scripts to run regularly, enabling continuous data collection and workflow automation

Python Data Visualization & Interactive Dashboards

Transform raw data into interactive visual insights by building dashboards with Python's top visualization tools. This course blends analysis, design, and deployment to help you showcase data professionally.

- Work with real-life datasets using Python's core libraries, including NumPy for numerical computing and pandas for data manipulation
- Create static and interactive visualizations using Matplotlib, Seaborn, and Plotly to clearly communicate trends and patterns
- Build multi-component dashboards using Dash Enterprise, incorporating callbacks, sliders, date pickers, and more
- Practice hands-on development by applying new skills to personalized projects with guided instructor support
- Publish your dashboards online using GitHub and Heroku to demonstrate your work to potential employers or clients
- Explore best practices for styling and structuring visual narratives that are clear, persuasive, and engaging

Python Machine Learning Bootcamp

Gain hands-on experience building predictive models using Python in this practical machine learning course, designed to help you understand core algorithms and apply them to real-world data.

- Explore foundational techniques including linear/logistic regression, k-nearest neighbors, decision trees, and random forest
- Understand regression vs. classification problems and when to apply each approach
- Apply cross-validation, train/test splits, and performance metrics to evaluate and refine models
- Use feature engineering to improve accuracy while managing overfitting and bias-variance tradeoffs
- Implement algorithms using Python's core data science libraries: NumPy, pandas, and scikit-learn
- Complete a final portfolio project demonstrating your ability to apply machine learning to real-world problems

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.