



Data Analytics Python Curriculum

OVERVIEW

Harness Python Programming and Advanced SQL to tell compelling stories with data. Build confidence and credibility to power insight-driven strategy on the job.

This course will teach you how to use large data sets to make critical decisions. This program was created for analysts, digital marketers, sales managers, product managers, and data novices looking to learn the essentials of data analysis. You'll use industry tools to analyze large real-world data sets and create dashboards and visualizations to share your findings. Data Analytics culminates in a portfolio-grade presentation of your analysis and insights to your classmates and instructional team.

PREREQUISITE

This is an advanced course. If you are new to advanced data analysis, your Admissions officer may recommend that you take our Data Analytics Beginners Course. Our Beginners course walks you through Excel, SQL and Tableau

The course also requires:

- Your own laptop (PC or Mac). It must be no more than four years old and able to run the most recent operating system.
- If remote, a webcam, headphones, and good access to the internet are

required. **CAPSTONE PROJECT**

The Capstone Project spans the entire duration of the program (12 weeks) in which students pursue independent projects on a question or problem of their choice, subject to approval from Nautika.

Students are strongly encouraged to choose a project

1. that has 70%+ relevant topics covered within the program,
2. in which the availability of data is 70%+ certain.

This is to ensure the project can be completed within the stipulated period.

The capstone project is both a valuable intellectual experience and also a vehicle through which students can demonstrate their competency to prospective employers.



Note: Completion of the Capstone Project is a requirement for graduation. Each project is designed to provide hands-on experience with as many data analytics concepts as possible.

Our instructors will be available to validate the feasibility and manage the scope of your

project. **DURATION**

12 Weeks

CONTENT

Unit 0	Introduction to Data Analytics with Python and SQL	<p><i>In this unit you will be introduced to the concepts of Data Analytics, Python Programming, and SQL.</i></p> <ul style="list-style-type: none">• Understanding Data Analytics• What is Python Programming• Get started with SQL
Unit 1	Querying and Organizing Data with SQL	<p><i>Use SQL to conduct advanced data querying, cleaning, and aggregation.</i></p> <p>Introduction to SQL</p> <ul style="list-style-type: none">• Navigate a relational database• Practice writing and executing SQL queries, including SELECT, FROM, WHERE, and DISTINCT SELECT• Work with logical and comparison operators in SQL <p>Grouping in SQL</p> <ul style="list-style-type: none">• Work with CASE to handle multiple conditions• Practice writing aggregate functions: MIN, MAX, SUM, AVG, and COUNT• Use advanced SQL commands such as GROUP BY and HAVING to group filter data <p>Combining Data with JOINS and UNIONS</p> <ul style="list-style-type: none">• Combine data from multiple sources using INNER and LEFT JOINS• Compile data using UNION and UNION ALL• Compare use cases for JOINS and UNIONS <p>Advanced JOINS and NULLS</p> <ul style="list-style-type: none">• Practice the concepts and syntax of advanced



		<ul style="list-style-type: none"> Practice query optimization techniques <p>Subqueries in SQL</p> <ul style="list-style-type: none"> Construct subqueries for multi-step operations Identify subquery use cases for various business scenarios Practice common table expressions (CTEs) with SELECT statements <p>Functions in SQL</p> <ul style="list-style-type: none"> Apply string, math, and date functions in SQL to prepare and analyze data Practice writing SQL queries with advanced functions to solve business problems <p>Python with MySQL</p> <ul style="list-style-type: none"> MySQL Get Started MySQL Create Database MySQL Create Table MySQL Insert MySQL Select MySQL Where MySQL Order By MySQL Delete MySQL Drop Table MySQL Update
	Project	Apply what you've learned in SQL and present your process, findings, and challenges to the class, giving and receiving peer-to-peer feedback.
Unit 2	Python and Fundamentals of Programming	<ul style="list-style-type: none"> Introduction to computer programming Understanding what IDEs and text editors are and how they are used Setting up the visual studio code How programming languages work Creating variables and understanding data types Understanding operators and operations Writing basic input and output statements Handling strings
	Project	Apply concepts learned to create a python program that uses basic input and output statements.

Unit 3	Control flow	<ul style="list-style-type: none"> • Understand and explain the uses of logical operators • Understand boolean values and create boolean expressions
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		<ul style="list-style-type: none"> • Build conditional statements to determine control flow
	Project	Apply concepts learned to evaluate boolean expressions and build complex conditional statements.
Unit 4	Loops and Functions	<ul style="list-style-type: none"> • Create and manipulate lists using methods • Understand the for loop and explore its use cases • Create and use functions
	Project	Write a series of python programs using loops and functions.
Unit 5	Introduction to Data and Data Analytics	<ul style="list-style-type: none"> • Understand what data is and its usefulness • Explore the various sources and types of data available • Discuss the value of data analytics • Making a case for problem-solving with data • Discuss the framework for data analytics • The 3 stage process: Clean, Extract and Visualize • Setting up anaconda for data analytics
	Project	Research on use cases for data analytics and determine how the framework for analytics can be employed.
Unit 6	Data cleaning with Python	<ul style="list-style-type: none"> • Understand the differences between categorical and numerical data • Introduction to the pandas library • Creating and manipulating dataframes • Joining datasets • Understand common features of dirty data • Handling missing values • Scaling and normalization • Parsing dates • Text processing
	Project	Real-world data would be provided for you to clean and prepare.

Unit 7	Extracting insights using Python	<ul style="list-style-type: none"> • Understand and use the aggregation functions in pandas • Generate summary statistics for data frames • Explore the relationships between columns • Basic text analytics
Unit 8	Advance Python	<p>Basics</p> <ul style="list-style-type: none"> • Intro to Python • Keywords and Identifiers • Statements and Indentations • Variables and Constants • Primitive data types in Python • Basics of I/O operations • Operators <p>Compound data types and their methods List, Tuples, Dictionary and sets</p> <p>Concept of looping Concept of control flow in loops If, if-else, if-elif-else statements Nested if statements</p> <ul style="list-style-type: none"> • For loop • While loop • Break, continue and pass statements <p>Functions</p> <ul style="list-style-type: none"> • Global, local and non-local functions • Arguments • Recursion function <p>I/O operations</p> <ul style="list-style-type: none"> • Concept of Input and output operations in Python • File exception • Directory and file management • Exception handling in Python <p>Pandas in Python</p> <ul style="list-style-type: none"> • Panda basic operations • Data types in Pandas • Read and write operation in pandas • Data manipulation • Data Wrangling <p>Numpy in Python</p> <ul style="list-style-type: none"> • Concept of array • Array manipulation using Numpy
	Project	Continue with the prepared data and generate summary statistics and extract insights.

Bonus Unit	Career Development Workshop	<ul style="list-style-type: none">• Email Etiquette• CV Writing• Cover Letter• Personal Branding• Creating an Elevator Pitch• Workplace Etiquette
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