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Python Developer Masters Program

About Edureka

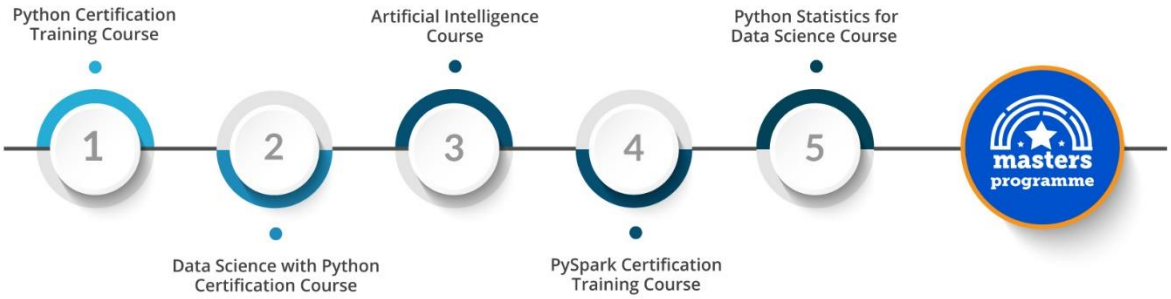
Edureka is one of the world's largest and most effective online education platform for technology professionals. In a span of 10 years, 100,000+ students from over 176 countries have upskilled themselves with the help of our online courses. Since our inception, we have been dedicated to helping technology professionals from all corners of the world learn Programming, Data Science, Big Data, Cloud Computing, DevOps, Business Analytic, Java & Mobile Technologies, Software Testing, Web Development, System Engineering, Project Management, Digital Marketing, Business Intelligence, Cybersecurity, RPA and more.

We have an easy and affordable learning solution that is accessible to millions of learners. With our learners spread across countries like the US, India, UK, Canada, Singapore, Australia, Middle East, Brazil, and many others, we have built a community of over 1 million learners across the globe.

About the Program

Edureka's Python Developer Masters Program is curated by industry experts after in-depth research to help you become an expert in Python and its various libraries. Learners can gain expertise on Data Science, Machine Learning, Deep Learning, Natural Language Processing, etc. and be industry-ready with our specially curated bouquet of hands-on and practical projects. This program is the ultimate opportunity to upskill, transform your professional trajectory, and unlock new opportunities. Join now and start your journey towards success!

Python Developer Masters Program



Elective Courses:

- Python Django Training and Certification
- Python Scripting Certification Training

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**Depending on industry requirements, Edureka may make changes to the course curriculum*

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Python Certification Training Course

masters program

Course Curriculum

Course Outline

Module 1: Introduction to Python

Topics:

- Need for programming
- Advantages of programming
- Overview of python
- Organizations using python
- Python Applications in various domains
- Variables
- Operands and expressions
- Conditional statements
- Loops
- Structural pattern matching

Module 2: Sequences and File Operations

Topics:

- Accepting user input and eval function
- Files input/output functions
- Lists

- Tuples
- Strings manipulation
- Sets and set operations
- Python dictionary

Module 3: Functions and Object-oriented Programming

Topics:

- User-defined functions
- Function parameters
- Different types of arguments
- Global variables
- Global keyword
- Lambda functions
- Built-in functions
- Object-oriented concepts
- Public, protected and private attributes
- Class variable and instance variable
- Constructor and destructor
- Inheritance and its types
- Method resolution order
- Overloading and overriding
- Getter and setter methods

Module 4: Working with Modules and Handling Exceptions

Topics:

- Standard libraries
- Packages and import statements

- Reload function
- Creating a module
- Important modules in python
- Sys module
- OS module
- Math module
- Date-time module
- Random module
- JSON module
- Regular expression
- Exception handling

Module 5: Array Manipulation using NumPy

Topics:

- Basics of data analysis
- NumPy - Arrays
- Array operations
- Indexing, slicing, and Iterating
- NumPy array attributes
- Matrix product
- NumPy functions
- Array manipulation
- File handling using NumPy

Module 6: Data Manipulation using Pandas

Topics:

- Basics of data analysis
- NumPy - Arrays
- Array operations
- Indexing, slicing, and Iterating
- NumPy array attributes
- Matrix product
- NumPy functions
- Array manipulation
- File handling using NumPy

Module 7: Data Visualization using Matplotlib and Seaborn

Topics:

- Why data visualization?
- Matplotlib library
- Seaborn
- Line plots
- Multiline plots
- Bar plot
- Histogram
- Pie chart
- Scatter plot
- Boxplot
- Saving charts
- Customizing visualizations
- Saving plots

- Grids
- Subplots
- Heatmaps

Module 8: GUI Programming

Topics:

- Ipywidgets package
- Numeric widgets
- Boolean widgets
- Selection widgets
- String widgets
- Date picker
- Color picker
- Container widgets
- Creating a GUI application

Module 9: Developing Web Maps and Representing Information using Plots (Self-paced)

Topics:

- Use of Folium library
- Use of Pandas library
- Flow Chart of web map application
- Developing web map using Folium and Pandas
- Reading Information from titanic dataset and represent It using plots

Module 10: Web Scraping and Computer Vision using OpenCV (Self-paced)

Topics:

- Beautiful Soup library
- Scrapy
- Requests library
- Scrap All hyperlinks from a webpage using Beautiful Soup and Requests
- Plotting charts using Bokeh
- Plotting scatterplots using Bokeh
- Image editing using OpenCV
- Face detection using OpenCV
- Motion detection and capturing video

Module 11: Database Integration with Python (Self-paced)

Topics:

- Basics of database management
- Python MySql
- Create database
- Create a table
- Insert into table
- Select query
- Where clause
- OrderBy clause
- Delete query
- Drop table
- Update query
- Limit clause
- Join and Self-Join

- MongoDB (Unstructured)
- Insert_one query
- Insert_many query
- Update_one query
- Update_many query
- Create_index query
- Drop_index query
- Delete and drop collections
- Limit query

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Data Science with Python Certification Course

Course Curriculum

Course Outline

Module 1*:* Introduction to Data Science and ML using Python.

Topics:

- Overview of Python
- The Companies using Python
- Different Applications where Python is Used
- Discuss Python Scripts on UNIX/Windows
- Values, Types, Variables
- Operands and Expressions
- Conditional Statements
- Loops
- Command Line Arguments
- Writing to the Screen
- What is Data Science?
- What does Data Science involve?
- Era of Data Science
- Business Intelligence vs Data Science
- Life cycle of Data Science
- Tools of Data Science

Module 2*:* Data Handling, Sequences and File Operations

Topics:

- Data Analysis Pipeline
- What is Data Extraction?
- Types of Data
- Raw and Processed Data
- Data Wrangling
- Python files I/O Functions
- Numbers
- Strings and related operations
- Tuples and related operations
- Lists and related operations
- Dictionaries and related operations
- Sets and related operations

Module 3*:* Deep Dive – Functions, OOPs, Modules, Errors, and Exceptions

Topics:

- Functions
- Function Parameters
- Global Variables
- Variable Scope and Returning Values
- Lambda Functions
- Object Oriented Concepts
- Standard Libraries
- Modules Used in Python
- The Import Statements
- Module Search Path

- Package Installation Ways
- Errors and Exception Handling
- Handling Multiple Exceptions

Module 4*:* Introduction to NumPy, Pandas, and Matplotlib

Topics:

- Data Analysis
- NumPy - arrays
- Operations on arrays
- Indexing, slicing, and iterating
- Reading and writing arrays on files
- Pandas - data structures & index operations
- Reading and Writing data from Excel/CSV formats into Pandas
- Metadata for imported Datasets
- Matplotlib library
- Grids, axes, plots
- Markers, colors, fonts, and styling
- Types of plots - bar graphs, pie charts, histograms
- Contour plots

Module 5*:* Data Manipulation

Topics:

- Basic Functionalities of a data object
- Merging of Data objects
- Concatenation of data objects
- Types of Joins on data objects
- Exploring and analyzing datasets

- Analysing a dataset

Module 6*:* Introduction to Machine Learning with Python

Topics:

- What is Machine Learning?
- Machine Learning Use-Cases
- Machine Learning Process Flow
- Machine Learning Categories
- Linear regression
- Gradient descent

Module 7*:* Supervised Learning - I

Topics:

- What are Classification and its use cases?
- What is a Decision Tree?
- Algorithm for Decision Tree Induction
- Creating a Perfect Decision Tree
- Confusion Matrix
- What is Random Forest?

Module 8*:* Dimensionality Reduction

Topics:

- Introduction to Dimensionality
- Why Dimensionality Reduction
- PCA
- Factor Analysis
- Scaling dimensional model

- LDA

Module 9*:* Supervised Learning - II

Topics:

- What is Naïve Bayes?
- How Naïve Bayes works?
- Implementing Naïve Bayes Classifier
- What is a Support Vector Machine?
- Illustrate how Support Vector Machine works
- Hyperparameter Optimization
- Grid Search vs. Random Search
- Implementation of Support Vector Machine for Classification

Module 10*:* Unsupervised Learning

Topics:

- What is Clustering & its Use Cases?
- What is K-means Clustering?
- How does the K-means algorithm works?
- How to do optimal clustering
- What is C-means Clustering?
- What is Hierarchical Clustering?
- How does Hierarchical Clustering work?

Module 11*:* Association Rules Mining and Recommendation Systems

Topics:

- What are Association Rules?

- Association Rule Parameters
- Calculating Association Rule Parameters
- Recommendation Engines
- How do Recommendation Engines work?
- Collaborative Filtering
- Content-Based Filtering

Module 12*:* Reinforcement Learning (Self-paced)

Topics:

- What is Reinforcement Learning?
- Why Reinforcement Learning?
- Elements of Reinforcement Learning
- Exploration vs. Exploitation dilemma
- Epsilon Greedy Algorithm
- Markov Decision Process (MDP)
- Q values and V values
- Q – Learning
- Values

Module 13*:* Time Series Analysis (Self-paced)

Topics:

- What is Time Series Analysis?
- Importance of TSA
- Components of TSA
- White Noise
- AR model
- MA model

- ARMA model
- ARIMA model
- Stationarity
- ACF & PACF

Module 14*:* Model Selection and Boosting

Topics:

- What is Model Selection?
- Need for Model Selection
- Cross Validation
- What is Boosting?
- How do Boosting Algorithms work?
- Types of Boosting Algorithms
- Adaptive Boosting

Module 15*:* Statistical Foundations (Self-paced)

Topics:

- What is Exploratory Data Analysis?
- EDA Techniques
- EDA Classification
- Univariate Non-graphical EDA
- Univariate Graphical EDA
- Multivariate Non-graphical EDA
- Multivariate Graphical EDA
- Heat Maps

Module 16*:* Database Integration with Python (Self-paced)

Topics:

- Basics of database management
- Python MySql
- Create database
- Create a table
- Insert into table
- Select query
- Where clause
- OrderBy clause
- Delete query
- Drop table
- Update query
- Limit clause
- Join and Self-Join
- MongoDB (Unstructured)
- Insert_one query
- Insert_many query
- Update_one query
- Update_many query
- Create_index query
- Drop_index query
- Delete and drop collections
- Limit query

Module 17*:* Data Connection and Visualization in Tableau (Self-paced)

Topics:

- Data Visualization

- Business Intelligence tools
- VizQL Technology
- Connect to data from the File
- Connect to data from the Database
- Basic Charts
- Chart Operations
- Combining Data
- Calculations

Module 18*:* Advanced Visualizations (Self-paced)

Topics:

- Trend lines
- Reference lines
- Forecasting
- Clustering
- Geographic Maps
- Using charts effectively
- Dashboards
- Story Points
- Visual best practices
- Publish to Tableau Online

Module 19*:* In-Class Project (Self-paced)

Topics:

- Predict the species of Plant.

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Course Curriculum

Course Outline

Module 1: **Introduction to Text Mining and NLP**

Topics:

- Overview of Text Mining
- Need of Text Mining
- Natural Language Processing (NLP) in Text Mining
- Applications of Text Mining
- OS Module
- Reading, Writing to text and word files
- Setting the NLTK Environment
- Accessing the NLTK Corpora

Module 2: Extracting, Cleaning and Preprocessing Text

Topics:

- Tokenization
- Frequency Distribution
- Different Types of Tokenizers
- Bigrams, Trigrams & Ngrams

- Stemming
- Lemmatization
- Stopwords
- POS Tagging
- Named Entity Recognition

Module 3: Analyzing Sentence Structure

Topics:

- Syntax Trees
- Chunking
- Chinking
- Context Free Grammars (CFG)
- Automating Text Paraphrasing

Module 4: Text Classification-I

Topics:

- Machine Learning: Brush Up
- Bag of Words
- Count Vectorizer
- Term Frequency (TF)
- Inverse Document Frequency (IDF)

Module 5: Introduction to Deep Learning

Topics:

- What is Deep Learning?
- Curse of Dimensionality
- Machine Learning vs. Deep Learning

- Use cases of Deep Learning
- Human Brain vs. Neural Network
- What is Perceptron?
- Learning Rate
- Epoch
- Batch Size
- Activation Function
- Single Layer Perceptron

Module 6: Getting Started with TensorFlow 2.0

Topics:

- Introduction to TensorFlow 2.x
- Installing TensorFlow 2.x
- Defining Sequence model layers
- Activation Function
- Layer Types
- Model Compilation
- Model Optimizer
- Model Loss Function
- Model Training
- Digit Classification using Simple Neural Network in TensorFlow 2.x
- Improving the model
- Adding Hidden Layer
- Adding Dropout
- Using Adam Optimizer

Module 7: Convolution Neural Network

Topics:

- Image Classification Example
- What is Convolution
- Convolutional Layer Network
- Convolutional Layer
- Filtering
- ReLU Layer
- Pooling
- Data Flattening
- Fully Connected Layer
- Predicting a cat or a dog
- Saving and Loading a Model
- Face Detection using OpenCV

Module 8: Regional CNN

Topics:

- Regional-CNN
- Selective Search Algorithm
- Bounding Box Regression
- SVM in RCNN
- Pre-trained Model
- Model Accuracy
- Model Inference Time
- Model Size Comparison
- Transfer Learning
- Object Detection – Evaluation

- mAP
- IoU
- RCNN – Speed Bottleneck
- Fast R-CNN
- RoI Pooling
- Fast R-CNN – Speed Bottleneck
- Faster R-CNN
- Feature Pyramid Network (FPN)
- Regional Proposal Network (RPN)
- Mask R-CNN

Module 9: Boltzmann Machine & Autoencoder

Topics:

- What is Boltzmann Machine (BM)?
- Identify the issues with BM
- Why did RBM come into the picture?
- Step-by-step implementation of RBM
- Distribution of Boltzmann Machine
- Understanding Autoencoders
- Architecture of Autoencoders
- Brief on types of Autoencoders
- Applications of Autoencoders

Module 10: Generative Adversarial Network (GAN)

Topics:

- Which Face is Fake?
- Understanding GAN

- What is Generative Adversarial Network?
- How does GAN work?
- Step by step Generative Adversarial Network implementation
- Types of GAN
- Recent Advances: GAN

Module 11: Emotion and Gender Detection (Self-paced)

Topics:

- Which Face is Fake?
- Understanding GAN
- What is Generative Adversarial Network?
- How does GAN work?
- Step by step Generative Adversarial Network implementation
- Types of GAN
- Recent Advances: GAN

Module 12: Introduction to RNN and GRU (Self-paced)

Topics:

- Issues with Feed Forward Network
- Recurrent Neural Network (RNN)
- Architecture of RNN
- Calculation in RNN
- Backpropagation and Loss calculation
- Applications of RNN
- Vanishing Gradient
- Exploding Gradient
- What is GRU?

- Components of GRU
- Update gate
- Reset gate
- Current memory content
- Final memory at current time step

Module 13: LSTM (Self-paced)

Topics:

- What is LSTM?
- Structure of LSTM
- Forget Gate
- Input Gate
- Output Gate
- LSTM architecture
- Types of Sequence-Based Model
- Sequence Prediction
- Sequence Classification
- Sequence Generation
- Types of LSTM
- Vanilla LSTM
- Stacked LSTM
- CNN LSTM
- Bidirectional LSTM
- How to increase the efficiency of the model?
- Backpropagation through time
- Workflow of BPTT

Module 14: Auto Image Captioning Using CNN LSTM (Self-paced)

Topics:

- Auto Image Captioning
- COCO dataset
- Pre-trained model
- Inception V3 model
- The architecture of Inception V3
- Modify the last layer of a pre-trained model
- Freeze model
- CNN for image processing
- LSTM or text processing

Module 15: Developing a Criminal Identification and Detection Application Using OpenCV (Self-paced)

Topics:

- Why is OpenCV used?
- What is OpenCV
- Applications
- Demo: Build a Criminal Identification and Detection App

Module 16: TensorFlow for Deployment (Self-paced)

Topics:

- Use Case: Amazon's Virtual Try-Out Room.
- Why Deploy models?
- Model Deployment: Intuit AI models
- Model Deployment: Instagram's Image Classification Models
- What is Model Deployment

- Types of Model Deployment Techniques
- TensorFlow Serving
- Browser-based Models
- What is TensorFlow Serving?
- What are Servables?
- Demo: Deploy the Model in Practice using TensorFlow Serving
- Introduction to Browser based Models
- Demo: Deploy a Deep Learning Model in your Browser.

Module 17: Text Classification-II (Self-paced)

Topics:

- Converting text to features and labels
- Multinomial Naive Bayes Classifier
- Leveraging Confusion Matrix

Module 18: In Class Project (Self-paced)

Topics:

- Sentiment Classification on Movie Rating Dataset

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Course Curriculum

Course Outline

Module 1*:* Introduction to Big Data Hadoop and Spark

Topics:

- What is Big Data?
- Big Data Customer Scenarios
- Limitations and Solutions of Existing Data Analytics Architecture with Uber Use Case
- How Hadoop Solves the Big Data Problem?
- What is Hadoop?
- Hadoop's Key Characteristics
- Hadoop Ecosystem and HDFS
- Hadoop Core Components
- Rack Awareness and Block Replication
- YARN and its Advantage
- Hadoop Cluster and its Architecture
- Hadoop: Different Cluster Modes
- Big Data Analytics with Batch & Real-Time Processing
- Why is Spark Needed?
- What is Spark?
- How Spark Differs from its Competitors?
- Spark at eBay

- Spark's Place in Hadoop Ecosystem

Module 2: Introduction to Python for Apache Spark

Topics:

- Overview of Python
- Different Applications where Python is Used
- Values, Types, Variables
- Operands and Expressions
- Conditional Statements
- Loops
- Command Line Arguments
- Writing to the Screen
- Python files I/O Functions
- Numbers
- Strings and related operations
- Tuples and related operations
- Lists and related operations
- Dictionaries and related operations
- Sets and related operations

Module 3: Functions, OOPS, and Modules in Python

Topics:

- Spark Components & its Architecture
- Spark Deployment Modes
- Introduction to PySpark Shell
- Submitting PySpark Job
- Spark Web UI
- Writing your first PySpark Job Using Jupyter Notebook
- Data Ingestion using Sqoop

Module 4: Deep Dive into Apache Spark Framework

Topics:

- Spark Components & its Architecture
- Spark Deployment Modes
- Introduction to PySpark Shell
- Submitting PySpark Job
- Spark Web UI
- Writing your first PySpark Job Using Jupyter Notebook
- Data Ingestion using Sqoop

Module 5: Playing with Spark RDDs

Topics:

- Challenges in Existing Computing Methods
- Probable Solution & How RDD Solves the Problem
- What is RDD, It's Operations, Transformations & Actions

- Data Loading and Saving Through RDDs
- Key-Value Pair RDDs
- Other Pair RDDs, Two Pair RDDs
- RDD Lineage
- RDD Persistence
- WordCount Program Using RDD Concepts
- RDD Partitioning & How it Helps Achieve Parallelization
- Passing Functions to Spark

Module 6: DataFrames and Spark SQL

Topics:

- Need for Spark SQL
- What is Spark SQL
- Spark SQL Architecture
- SQL Context in Spark SQL
- Schema RDDs
- User Defined Functions
- Data Frames & Datasets
- Interoperating with RDDs
- JSON and Parquet File Formats
- Loading Data through Different Sources
- Spark-Hive Integration

Module 7: Machine Learning using Spark MLlib

Topics:

- Why Machine Learning
- What is Machine Learning
- Where Machine Learning is used
- Face Detection: USE CASE
- Different Types of Machine Learning Techniques
- Introduction to MLlib
- Features of MLlib and MLlib Tools
- Various ML algorithms supported by MLlib

Module 8: Deep Dive into Spark MLlib

Topics:

- Supervised Learning: Linear Regression, Logistic Regression, Decision Tree, Random Forest
- Unsupervised Learning: K-Means Clustering & How It Works with MLlib
- Analysis of US Election Data using MLlib (K-Means)

Module 9: Understanding Apache Kafka and Apache Flume

Topics:

- Need for Kafka
- What is Kafka
- Core Concepts of Kafka
- Kafka Architecture
- Where is Kafka Used
- Understanding the Components of Kafka Cluster

- Configuring Kafka Cluster
- Kafka Producer and Consumer Java API
- Need of Apache Flume
- What is Apache Flume
- Basic Flume Architecture
- Flume Sources
- Flume Sinks
- Flume Channels
- Flume Configuration
- Integrating Apache Flume and Apache Kafka

Module 10: Apache Spark Streaming - Processing Multiple Batches

Topics:

- Drawbacks in Existing Computing Methods
- Why Streaming is Necessary
- What is Spark Streaming
- Spark Streaming Features
- Spark Streaming Workflow
- How Uber Uses Streaming Data
- Streaming Context & DStreams
- Transformations on DStreams
- Describe Windowed Operators and Why it is Useful
- Important Windowed Operators
- Slice, Window and ReduceByWindow Operators
- Stateful Operators

Module 11: Apache Spark Streaming - Data Sources

Topics:

- Apache Spark Streaming: Data Sources
- Streaming Data Source Overview
- Apache Flume and Apache Kafka Data Sources
- Example: Using a Kafka Direct Data Source

Module 12: Implementing an End-to-End Project

Topics:

- Project 1- Domain: Finance
- Project 2- Domain: Media and Entertainment

Module 13: Spark GraphX (Self-paced)

Topics:

- Introduction to Spark GraphX
- Information about a Graph
- GraphX Basic APIs and Operations
- Spark GraphX Algorithm - PageRank, Personalized PageRank, Triangle Count, Shortest Paths, Connected Components, Strongly Connected Components, Label Propagation

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Python Statistics for Data Science Course (Self-Paced)

Course Curriculum

Course Outline

Module 1: Understanding the Data

Topics:

- Introduction to Data Types
- Numerical parameters to represent data.
    a. Mean
    b. Mode
    c. Median
    d. Sensitivity
    e. Information Gain
    f. Entropy
- Statistical parameters to represent data.

Module 2: Probability and its uses

Topics:

- Uses of probability
- Need of probability
- Bayesian Inference
- Density Concepts

- Normal Distribution Curve

Module 3: Statistical Inference

Topics:

- Point Estimation
- Confidence Margin
- Hypothesis Testing
- Levels of Hypothesis Testing

Module 4: Data Clustering

Topics:

- Association and Dependence
- Causation and Correlation
- Covariance
- Simpson's Paradox
- Clustering Techniques

Module 5: Testing the Data

Topics:

- Parametric Test
- Parametric Test Types
- Non- Parametric Test
- Experimental Designing
- A/B testing

Module 6: Regression Modelling

Topics:

- Logistic and Regression Techniques
- Problem of Collinearity
- WOE and IV
- Residual Analysis
- Heteroscedasticity
- Homoscedasticity