Data Science

Learning Path

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About the Learning Path

This Data Science learning path will accelerate your career in Data Science and provide you with world- class training. The programme offers extensive training on the most in-demand Data Science and Machine Learning skills including Python, R, Tableau, and concepts of Machine Learning. Become an expert in Data Science by diving deep into the nuances of data interpretation by mastering technologies like Machine Learning and powerful programming skills to take your career in Data Science to the next level.

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Programme Outcomes

Gain an in-depth understanding of data structure and data manipulation

Gain expertise in mathematical computing using the NumPy and scikit-learn packages

Understand and use linear and non-linear regression models and classification techniques for data analysis

Master the concepts of recommendation engines and time series modeling and gain practical mastery over principles, algorithms, and applications of Machine Learning

Obtain an in-depth understanding of supervised and unsupervised learning models such as linear regression, logistic regression, clustering, dimensionality reduc tion, K-NN, and pipelines

Learn to analyse data using Tableau and become proficient in building interactive dashboards

Perform scientific and technical computing using the SciPy package and its sub-packages such as Integrate, Optimize, Statistics, IO, and Weave

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Learning Path Visualisation

1. Python for Data Science
2. Data Science with Python
3. Machine Learning
4. Tableau Training
5. Data Science Capstone Project

Electives

- SQL Training
- Data Science with R Programming
- Deep Learning with Keras and TensorFlow
- Industry Masterclass Delivered by IBM

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Who Should Enroll in this Programme?

The Data Science role requires an amalgam of experience, Data Science knowledge, and using the correct tools and technologies. It is a solid career choice for both new and experienced professionals. Aspiring professionals of any educational background with an analytical frame of mind are most suited to pursue the Data Science Learnership programme, including:

- IT Professionals
- Analytics Managers
- Business Analysts
- Banking and Finance Professionals
- Marketing Managers
- Supply Chain Network Managers
- Beginners or Recent Graduates

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Python for Data Science

Kickstart your learning of Python for Data Science with this introductory course and familiarise yourself with programming. Carefully crafted by IBM, upon completion of this course you will be able to write your Python scripts, perform fundamental hands-on data analysis using the Jupyterbased lab environment, and create your own Data Science projects using IBM Watson.

Key Learning Objectives

- Write your first Python program by implementing concepts of variables, strings, functions, loops, and conditions.
- Understand the nuances of lists, sets, dictionaries, conditions and branching, and objects and classes.
- Work with data in Python such as reading and writing files, loading, working, and saving data with Pandas.

Course curriculum

- Lesson 1 - Python Basics
- Lesson 2 - Python Data Structures
- Lesson 3 - Python Programming Fundamentals
- Lesson 4 - Working with Data in Python
- Lesson 5 - Working with NumPy Arrays

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Data Science with **Python**

This Data Science with Python course will establish your mastery of Data Science and analytics techniques using Python. With this Python for Data Science Course, you'll learn the essential concepts of Python programming and gain in-depth knowledge in data analytics, Machine Learning, data visualisation, web scraping, and natural language processing. Python is a required skill for many Data Science positions, so jump start your career with this interactive, hands-on course.

Key Learning Objectives

- Gain an in-depth understanding of Data Science processes, data wrangling, data exploration, data visualisation, hypothesis building, and testing. You will also learn the basics of statistics.
- Install the required Python environment and other auxiliary tools and libraries.
- Understand the essential concepts of Python programming such as data types, tuples, lists, dicts, basic operators and functions.
- Perform high-level mathematical computing using the NumPy package and its vast library of mathematical functions.
- Perform scientific and technical computing using the SciPy package and its sub-packages such as Integrate, Optimize, Statistics, IO, and Weave.
- Perform data analysis and manipulation using data structures and tools provided in the Pandas package.
- Gain expertise in Machine Learning using the Scikit-Learn package.

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- Gain an in-depth understanding of supervised learning and unsupervised learning models such as linear regression, logistic regression, clustering, dimensionality reduction, K-NN and pipe
- Use the Scikit-Learn package for natural language processing.t
- Use the matplotlib library of Python for data visualisation.
- Extract useful data from websites by performing web scraping using Python.
- Integrate Python with Hadoop, Spark, and MapReduce

Course curriculum

- Lesson 1 - Data Science Overview
- Lesson 2 - Data Analytics Overview
- Lesson 3 - Statistical Analysis and Business Applications
- Lesson 4 - Python Environment Setup and Essentials
- Lesson 5 - Mathematical Computing with Python (NumPy)
- Lesson 6 - Scientific computing with Python (Scipy)
- Lesson 7 - Data Manipulation with Pandas
- Lesson 8 - Natural Language Processing with Scikit Learn
- Lesson 9 - Data Visualization in Python using matplotlib
- Lesson 10 - Web Scraping with BeautifulSoup
- Lesson 11 - Python integration with Hadoop MapReduce and Spark

Machine **Learning**

This Machine Learning course will make you an expert in Machine Learning, a form of Artificial Intelligence that automates data analysis to enable computers to learn and adapt through experience to do specific tasks without explicit programming. You will master Machine Learning concepts and techniques, including supervised and unsupervised learning, mathematical and heuristic aspects, and hands-on modeling to develop algorithms and prepare you for your role with advanced Machine Learning knowledge.

Key Learning Objectives

- Master the concepts of supervised and unsupervised learning, recommendation engine, and time series modeling
- Gain practical mastery over principles, algorithms, and applications of Machine Learning through a hands-on approach that includes working on four major end-to-end projects and 25+ hands-on exercises
- Acquire thorough knowledge of the statistical and heuristic aspects of Machine Learning
- Implement models such as support vector machines, kernel SVM, naive Bayes, decision tree classifier, random forest classifier, logistic regression, K-means clus□tering and more in Python.
- Validate Machine Learning models and decode various accuracy metrics. Improve the final models using another set of optimization algorithms, which include Boosting & Bagging techniques.
- Comprehend the theoretical concepts and how they relate to the practical aspects of Machine Learning

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Course curriculum

- Lesson 1 - Introduction to Artificial Intelligence and Machine Learning
- Lesson 2 - Data Wrangling and Manipulation
- Lesson 3 - Supervised Learning
- Lesson 4 - Feature Engineering
- Lesson 5 - Supervised Learning-Classification
- Lesson 6 - Unsupervised learning
- Lesson 7 - Time Series Modelling
- Lesson 8 - Ensemble Learning
- Lesson 9 - Recommender Systems
- Lesson 10 - Text Mining

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Tableau **Training**

This Tableau course helps you understand how to build visualisations, organise data, and design charts and dashboards to empower more meaningful business decisions. You'll be exposed to the concepts of Data Visualisation, different combo charts, and stories, working with filters, parameters, and sets, and building interactive dashboards

Key Learning Objectives

- Become an expert on visualisation techniques such as heat map, treemap, waterfall, Pareto.
- Understand metadata and its usage
- Work with Filter, Parameters, and Sets.
- Master special field types and Tableau-generated fields and the process of creating and using parameters.
- Learn how to build charts, interactive dashboards, story interfaces, and how to share your work.
- Master the concepts of data blending, create data extracts and organise and format data.

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Course curriculum

- Lesson 1 - Getting Started with Tableau
- Lesson 2 - Core Tableau in Topics
- Lesson 3 - Creating Charts in Tableau
- Lesson 4 - Working with Metadata
- Lesson 5 - Filters in Tableau
- Lesson 6 - Applying Analytics to the worksheet
- Lesson 7 - Dashboard in Tableau
- Lesson 8 - Modifications to Data Connections
- Lesson 9 - Introduction to Level of Details in Tableau (LODS)

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Data Science Capstone Project

This Data Science Capstone project will give you an opportunity to implement the skills you learned throughout this programme. Through dedicated mentoring sessions, you'll learn how to solve a real-world, industry-aligned data science problem, from data processing and model building to reporting your business results and insights. This project is the final step in the learning path and will enable you to showcase your expertise in data science to future employers.

Key Learning Objectives

Data Science Capstone Project will bring you through the Data Science decision cycle, including data processing, building a model and representing results. The project milestones are as follows:

- Data Processing - In this step, you will apply various data processing techniques to make raw data meaningful.
- Model Building - You will leverage techniques such as regression and decision trees to build Machine Learning models that enable accurate and intelligent predictions. You may explore Python, R to build your model. You will follow the complete model-building exercise from data split to test and training and validating data using the k-fold crossvalidation process
- Model Fine-tuning - You will apply various techniques to improve the accuracy of your model and select the champion model that provides the best accuracy.
- Dashboarding and Representing Results - As the last step, you will be required to export your results into a dashboard with meaningful insights using Tableau.

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SQL **Training**

This course gives you the information you need to successfully start working with SQL databases and make use of the database in your applications. Learn the concepts of fundamental SQL statements, conditional statements, commands, joins, subqueries, and various functions to manage your SQL database for scalable growth.

Key Learning Objectives

- Understand databases and relationships.
- Use common query tools and work with SQL commands.
- Understand transactions, creating tables, and views.
- Comprehend and execute stored procedures.

Course curriculum

- Lesson 1 - Fundamental SQL Statements
- Lesson 2 - Restore and Back-up
- Lesson 3 - Selection Commands: Filtering
- Lesson 4 - Selection Commands: Ordering
- Lesson 5 - Alias
- Lesson 6 - Aggregate Commands
- Lesson 7 - Group By Commands
- Lesson 8 - Conditional Statement
- Lesson 9 - Joins
- Lesson 10 - Subqueries

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- Lesson 11 - Views and Index
- Lesson 12 - String Functions
- Lesson 13 - Mathematical Functions
- Lesson 14 - Date and Time Functions
- Lesson 15 - Pattern (String) Matching
- Lesson 16 - User Access Control Functions

Data Science **with R**

The next step to becoming a Data Scientist is learning R—the most indemand open source technology. R is a powerful Data Science and analytics language, which has a steep learning curve and a very vibrant community. This is why it is quickly becoming the technology of choice for organizations who are adopting the power of analytics for competitive advantage.

Key Learning Objectives

- Gain a foundational understanding of business analytics
- Install R, R-studio and workspace setup, and learn about the various R packages
- Master R programming and understand how various statements are executed in R.
- Gain an in-depth understanding of data structure used in R and learn how to import/export data in R.
- Define, understand, and use the various apply functions and DPLYR functions.
- Understand and use the various graphics in R for data visualisation.
- Gain a basic understanding of various statistical concepts.
- Understand and use hypothesis testing method to drive business decisions.
- Understand and use linear and non-linear regression models, and classification techniques for data analysis.
- Learn and use the various association rules and Apriori algorithm.
- Learn and use clustering methods including K-Means, DBSCAN, and hierarchical clustering.

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Course curriculum

- Lesson 1 - Introduction to Business Analytics
- Lesson 2 - Introduction to R Programming
- Lesson 3 - Data Structures
- Lesson 4 - Data Visualisation
- Lesson 5 - Statistics for Data Science I
- Lesson 6 - Statistics for Data Science II
- Lesson 7 - Regression Analysis
- Lesson 8 - Classification
- Lesson 9 - Clustering
- Lesson 10 - Association

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Deep Learning with **Keras and TensorFlow**

This Deep Learning with TensorFlow course by IBM will refine your Machine Learning knowledge and make you an expert in deep learning using TensorFlow. Master the concepts of deep learning and TensorFlow to build artificial neural networks and traverse layers of data abstraction. This course will help you learn to unlock the power of data and prepare you for new horizons in AIDeep Learning with TensorFlow and Keras This course will take you from machine learning to the next level, providing you with a solid understanding of deep learning using TensorFlow and Keras. Master the concepts of deep learning to build artificial neural networks and traverse layers of data abstraction. This course will help you learn how to unlock the power of data and prepare you for new horizons in artificial intelligence.

Key Learning Objectives

- Understand deep learning leveraging neural networks.
- Gain a fair understanding of Tensorflow and Keras.
- Comprehend convolutional neural networks (CNNs) and their applications
- Gain familiarity with recurrent neural networks (RNNs) and autoencoders.
- Optimize the performance of your neural network using L2 regularisation and dropout layer.
- Create autoencoder models to detect anomalies

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Course curriculum

- Lesson 1 - AI and Deep Learning Introduction
- Lesson 2 - Artificial Neural Network
- Lesson 3 - Deep Neural Network and Tools
- Lesson 4 - Deep Neural Net Optimization, Tuning, and Interpretability
- LLesson 5 - Convolutional Neural Net (CNN)
- Lesson 6 - Recurrent Neural Networks
- Lesson 7 - Autoencoders

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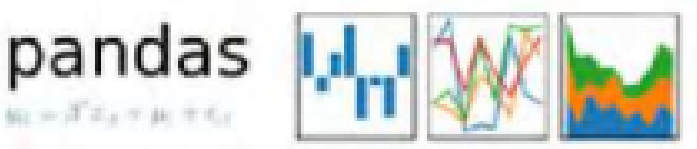
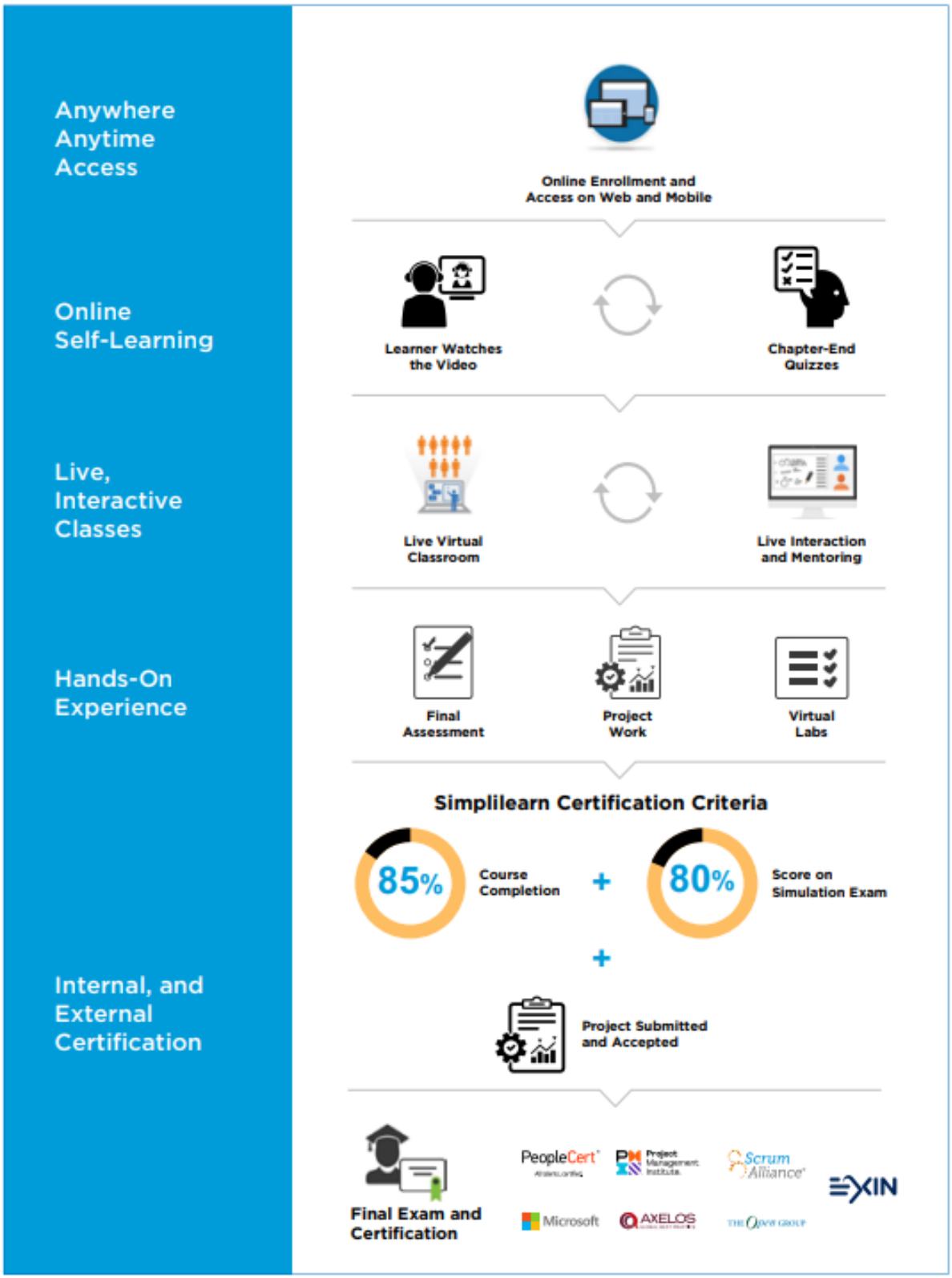
Industry Masterclass

Attend this online interactive industry masterclass to gain insights about Data Science advancements and AI techniques.

Tools Covered



Classroom-Level Immersion: Delivered Digitally



Features of Corporate Training:

Tailored learning solutions

Flexible pricing options

Enterprise-grade learning management system (LMS)

Enterprise dashboards for individuals and teams

24X7 learner assistance and support

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About Us

Deviare is a leader in digital skills training, focused on the emerging technologies that are transforming Africa. Our blended learning approach drives learner engagement. Partnering with professionals and companies, we identify their unique needs and provide outcome-centric solutions to help them achieve their professional goals.

For more information, please visit our website: **www.deviare.africa**