Course Title: Introduction To Data Science, Machine Learning & AI Using Python	**Course Duration**: 5.0 Days
Exam: Included	**Exam Type**: Proctored Exam
Qualification: Introduction To Data Science, Machine Learning & AI Using Python Certificate	

Course Syllabus

Our Introduction To Data Science, Machine Learning & AI Using Python training course will cover the following Modules:

Module 1: The Role of a Data Scientist: Combining Technical and Non-Technical Skills

- What is the required skillset of a Data Scientist?
- Combining the technical and non-technical roles of a Data Scientist
- The difference between a Data Scientist and a Data Engineer
- Exploring the entire lifecycle of Data Science efforts within the organisation
- Turning business questions into Machine Learning (ML) and Artificial Intelligence (AI) models
- Exploring diverse and wide-ranging data sources that you can use to answer business questions
- Examine the difference between Generative AI and Discriminative AI

Module 2: Data Manipulation and Visualisation using Python's Pandas and Matplotlib Libraries

- Introducing the features of Python that are relevant to Data Scientists and Data Engineers
- Viewing Data Sets using Python’s Pandas library
- Importing, exporting, and working with all forms of data, from Relational Databases to Google Images
- Using Python Selecting, Filtering, Combining, Grouping, and Applying Functions from Python's Pandas library
- Dealing with Duplicates, Missing Values, Rescaling, Standardising, and Normalising Data
- Visualising data for both exploration and communication with the Pandas, Matplotlib, and Seaborn Python libraries

Module 3: Pre-processing and Analysing Unstructured Data with Natural Language Processing

- Preprocessing Unstructured Data such as web adverts, emails, and blog posts for AI/ML models
- Exploring the most popular approaches to Natural Language Processing (NLP), such as stemming and "stop" words
- Preparing a term-document matrix (TDM) of unstructured documents for analysis
- Look at how Data Scientists can integrate Large Language Models (LLMs) in their work

Module 4: Linear Regression and Feature Engineering for Business Problem Solving

- Expressing a business problem, such as customer revenue prediction, as a linear regression task
- Assessing variables as potential Predictors of the required Target (e.g., Education as a predictor of Salary Build)
- Interpreting and Evaluating a Linear Regression model in Python using measures such as RMSE
- Exploring the Feature Engineering possibilities to improve the Linear Regression model

Module 5: Classification Models and Evaluation for Predictive Analysis

- Learning how AI/ML Classifiers are built and used to make predictions such as Customer Churn

- Exploring how AI/ML Classification models are built using Training, Test, and Validation
- Evaluating the strength of a Decision Tree Classifier

Module 6: Alternative Approaches to Classification and Model Evaluation

- Examining alternative approaches to classification
- Considering how Activation Functions are integral to Logistic Regression Classifiers
- Investigating how Neural Networks and Deep Learning are used to build self-driving cars
- Exploring the probability foundations of Naive Bayes classifiers
- Reviewing different approaches to measuring the performance of AI/ML Classification Models
- Reviewing ROC curves, AUC measures, Precision, Recall, and Confusion Matrices

Module 7: Clustering Techniques for Customer and Product Segmentation

- Uncovering new ways of segmenting your customers, products, or services using clustering algorithms
- Exploring what the concept of similarity means to humans and how you can implement it programmatically through distance measures on descriptive variables
- Performing top-down clustering with Python's Scikit-Learn K-Means algorithm
- Performing bottom-up clustering with Scikit-Learn's hierarchical clustering algorithm
- Examining clustering techniques on unstructured data (e.g., Tweets, Emails, Documents, etc.)

Module 8: Association Rules and Recommender Systems for Business Applications

- Building models of customer behaviours or business events from logged data using Association Rules
- Evaluating the strength of these models through probability measures of support, confidence, and lift
- Employing feature engineering approaches to improve the models
- Building a recommender for your customers that is unique to your product/service offering

Module 9: Network Analysis for Organisational Insights

- Analysing your organisation, its people, and its environment as a network of inter-relationships
- Visualising these relationships to uncover previously unseen business insights
- Exploring ego-centric and socio-centric methods of analysing connections critical to your organisation

Module 10: Big Data Analytics, Communication, and Ethics

- Examining Cloud (Microsoft, Amazon, Google) approaches to handling Big Data analytics
- Exploring the communications and ethics aspects of being a Data Scientist
- Discuss the ethical implications of recent developments in AI
- Surveying the paths of continual learning for a Data Scientist

Course Overview

Our five-day Introduction To Data Science, Machine Learning & AI Using Python training course you will start with exploring the role of a data scientist and the lifecycle of data science efforts within an organisation. Then, you'll dive into the technical skills you need, such as using Python and its relevant libraries for data analysis and visualisation, pre-processing unstructured data, and building AI/ML models.

You'll also explore key machine learning algorithms, including linear regression, decision tree classifiers, and clustering algorithms. And, you'll learn how to apply these techniques to real-world problems, such as predicting customer churn and building recommendation engines.

Throughout **data science training**, you'll have the opportunity to work on hands-on exercises and projects, allowing you to practice your skills and build your portfolio. By the end of the course, you'll have a deep understanding of the data science process, the tools and techniques used by data scientists, and the ability to apply these skills to real-world problems.

Course Learning Outcomes

Our Introduction To Data Science, Machine Learning & AI Using Python training course will teach you to become proficient in the following:

- Differentiate between Predictive AI and Generative AI.
- Translate everyday business questions and problems into Machine Learning tasks to make data-driven decisions.
- Use Python Pandas, Matplotlib & Seaborn libraries to explore, analyse, and visualise data from various sources, including the web, word documents, email, NoSQL stores, databases, and data warehouses.
- Train a Machine Learning Classifier using different algorithmic techniques from the Scikit-Learn library, such as Decision Trees, Logistic Regression, and Neural Networks.
- Re-segment your customer market using K-Means and Hierarchical algorithms to better align products and services to customer needs.
- Discover hidden customer behaviours from Association Rules and build a Recommendation Engine based on behavioural patterns.
- Investigate relationships & flows between people and business-relevant entities using Social Network Analysis.
- Build predictive models of revenue and other numeric variables using Linear Regression.
- Test your knowledge with the included end-of-course exam.
- Leverage continued support with after-course one-on-one instructor coaching and computing sandbox.

Audience

Our Introduction To Data Science, Machine Learning & AI Using Python training course will benefit several individuals and organisations including but not limited to:

- Beginners in Data Science
- Aspiring Data Scientists
- Programmers
- Software Developers
- Students
- Researchers
- Professionals in Other Fields
- Career Changers

Entry-Level Requirements

There are no entry-level requirements Introduction To Data Science, Machine Learning & AI Using Python training course.

Recommended Reading

There is no recommended reading for our Introduction To Data Science, Machine Learning & AI Using Python training course.

What's Included

Our Introduction To Data Science, Machine Learning & AI Using Python training course contains the following:

- 5-day instructor-led training course
- After-course coaching available
- After-course computing sandbox access included
- End-of-course exam included
- Pre-reading
- Course Manual
- Quizzes
- Exercises

Exam Information

Introduction To Data Science, Machine Learning & AI Using Python Exam:

- Format: Multiple Choice
- Questions: 40
- Pass Mark: 70%

What's Next

Attendees may enjoy our BCS Artificial Intelligence (AI) Foundation training course.

Our three-day Artificial Intelligence (AI) Foundation training course will teach you the building blocks of AI and how to use your newfound understanding of Machine Learning.

Our Artificial Intelligence (AI) Foundation training course is a fantastic opportunity to engage with AI Expert - Dr Andrew Lowe. You will learn about AI, Machine Learning and Neural Networks and be able to apply your knowledge to your current or future career.

Additional Information

Our Introduction To Data Science, Machine Learning & AI Using Python training course offers several benefits to individuals and organisations including but not limited to:

- **Strong Foundation in Data Science**: The course provides a solid foundation in data science, introducing you to key concepts, techniques, and methodologies.
- **Practical Hands-on Experience**: The course offers practical exercises and projects that allow you to apply your knowledge in real-world scenarios.
- **Python for Data Science**: Python is one of the most widely used programming languages in the field of data science and AI.
- **Versatility and Flexibility**: Python is known for its versatility and flexibility. It offers a wide range of libraries and frameworks specifically designed for data science and AI, such as NumPy, Pandas, Scikit-learn, and TensorFlow.
- **Entry Point to Advanced Topics**: This beginner's guide acts as a stepping stone for further learning in data science, machine learning, and AI.
- **Career Opportunities**: Data science, machine learning, and AI are rapidly growing fields with a high demand for skilled professionals.
- **Problem-Solving and Analytical Thinking**: Data science and AI involve analysing complex data, identifying patterns, and developing models to solve problems and make informed decisions.
- **Understanding AI Applications**: Artificial intelligence is transforming various industries, including healthcare, finance, marketing, and more.