Certified Professional Diploma

Data Science

Practical Training on Real World Industrial Projects

Target Learners: Undergraduates and Job Professionals

Pre-requisite: Basic computer technological skills

Duration: 3.5 Months (3 sessions each week = Total 40 sessions)

Credit Hours: 80 (6 Hours each week)

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Enrollment Form: https://forms.gle/wHUTGTGtAAba5AjN6

Key Takeaways

By the end of this course, learners will be able to:

- Understand the scope, applications, and trends of Data Science across industries.
- Explain the roles, responsibilities, and ethics of a Data Scientist.
- Set up and use a Python data science environment with Anaconda and Jupyter.
- Apply Python fundamentals and data structures for data analysis tasks.
- Manipulate and analyze datasets using NumPy and Pandas.
- Collect data from APIs, files, databases, and web sources.
- Clean, preprocess, and transform data for analysis and modeling.
- Perform feature engineering and selection to improve model performance.
- Conduct Exploratory Data Analysis (EDA) using statistics and visualizations.
- Build and evaluate basic machine learning models for regression and classification.
- Apply model validation techniques and address overfitting and underfitting.
- Create effective data visualizations and dashboards to communicate insights.
- Understand Big Data concepts and cloud-based analytics platforms.
- Use cloud tools like Google Colab and Kaggle for data science workflows.
- Develop professional skills including communication, freelancing basics, and interview readiness.

Approved by

ViLabs Academy, Advisory Board Members (ABM) comprises senior educators, industry leaders, and global technology experts who provide strategic guidance across training design and curriculum development. The Board actively reviews course content, ensures alignment with current industry demands, and validates learning outcomes against global skill standards. Their involvement guarantees that all ViLabs Academy programs remain credible, practical, and workforce-ready, giving learners and partners confidence in the quality and relevance of our education.

Software/Tools to be learn

- Anaconda
- Jupyter Notebook
- Google Colab
- AWS / GCP / Azure (Intro level)
- LinkedIn

Course Outline

Week 1

- Introduction to Data Science: Scope, Applications, and Trends
- AI & ML Basics, Roles & Responsibilities of a Data Scientist
- Data Science Workflow & Project Lifecycle

Week 2

- Tools & Technologies: Jupyter, Python
- Pandas, Scikit-Learn
- Setting up Python Environment (Anaconda, Jupyter)

Week 3

- Python Basics: Variables, Data Types, Operators
- Control Structures: if-else, loops, and functions
- Data Structures: Lists, Tuples, Dictionaries, Sets

Week 4

- NumPy for numerical operations & Pandas basics
- Sources of Data: APIs, Web Scraping, Databases, CSV/Excel

- Handling Missing Data & Duplicates

Week 5

- Data Cleaning: Outliers, Normalization, Encoding
- Feature Engineering & Selection
- Scaling & Transformation of Data

Week 6

- Understanding Data Types & Distributions
- Descriptive Statistics and Summary Functions
- Identifying Trends, Patterns & Correlations

Week 7

- Pandas Profiling and Seaborn for Insights
- Mid Term Exam
- Introduction to Machine Learning Concepts

Week 8

- Types of ML: Supervised vs Unsupervised
- Building Regression & Classification Models
- Model Training, Testing & Validation

Week 9

- Overfitting, Underfitting & Cross-Validation
- Importance of Data Visualization in Storytelling
- Charts & Graphs with Matplotlib

Week 10

- Visualizations with Seaborn
- Interactive Dashboards: Intro to Plotly/Power BI
- Visualization Best Practices & Presenting Insights

Week 11

- Big Data Concepts
- Structured vs Unstructured Data
- Intro to Cloud Platforms: AWS, GCP, Azure

Week 12

- Google Colab & Kaggle for Cloud Analysis
- Cloud-Based Tools & Real-World Case Studies
- Explore freelancing basics, top marketplaces like Upwork & Fiver

Week 13

- "Effective principles of oral and written communication, Listening skills – listening to the employer and clients, Feedback to the clients, and ethics "
- "Resume Writing- theory and practice, LinkedIn profile- importance, and account creation "

- " Employment interviews- theory, discussion, pair interview simulation, group simulation"

Week 14

- Final Exam

Assignments

- Report on 3 real-world applications of Data Science
- Analyze a CSV dataset
- Feature engineering on given data
- Create an EDA report with charts
- Evaluate model performance
- Create a project insights report
- Compare cloud platforms & big data tools

Quizzes

- Core concepts of data science
- Python syntax & Pandas operations
- Data collection & preprocessing concepts
- EDA techniques & visualization
- ML basics & model validation
- Visualization techniques & dashboarding
- Big data & cloud integration concepts

Projects

1. Real-World Data Science Applications Report
2. Python Dataset Exploration
3. CSV Data Analysis
4. Data Collection
5. Data Cleaning & Preprocessing
6. Feature Engineering
7. Exploratory Data Analysis (EDA)
8. Regression Modeling Project
9. Classification Modeling Project
10. Model Evaluation & Optimization
11. Data Visualization & Storytelling
12. Interactive Dashboard
13. Cloud-Based Data Analysis
14. Big Data & Cloud Tools Comparison

15. Capstone Project – MNIST Digit Classification