Government of Pakistan

**National Vocational and Technical Training Commission**

**Blended International IT Trainings –**

**BIITT 2025**



**Course Contents/ Lesson Plan**

**Course Title:** IBM Data Analyst

Professional Certificate

**Duration: 3** Months

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| --- | --- |
| **Trainer Name** |  |
| **Course Title** | **IBM Data Analyst Professional Certificate** |
| **Objective of Course** | Prepare for a career in the **high-growth field of data analytics**. In this program, you’ll learn in-demand skills like Python, Excel, and SQL to get job-ready in as little as 4 months.Data analysis is the process of collecting, storing, modeling, and analyzing data that can inform executive decision-making, and the **demand for skilled data analysts has never been greater.**This program will teach you the foundational data skills employers are seeking for entry-level data analytics roles. It will not only help you start your career in data analytics, but also **provides a strong foundation** for future career development in other paths such as data science, artificial intelligence, deep learning, or data engineering. You’ll learn the latest skills and tools used by professional data analysts including Excel spreadsheets, Python, Pandas, Numpy, Jupyter Notebooks, Cognos Analytics, and more. You’ll work with a variety of data sources and project scenarios to gain practical experience with data manipulation and applying analytical skills. You'll also have the option to learn how generative AI tools and techniques are used in data analysis. |
| **Course Execution Plan** | Total Duration of Course: **3 Months (12 Weeks)** |
| Class Hours: **3 Hours per day** |
| **Theory: 30% Practical: 70%** |
| Weekly Hours: **15 Hours Per week** |
| Total Contact Hours: **200 Hours** |

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| **Learning Outcome of the Course** | Throughout the program, you’ll complete hands-on projects and labs and gain a firm grasp on the required technical skills to effectively gather, wrangle, mine, and visualize data, as well as the soft skills for working with stakeholders and storytelling with data to engage your audience. You will: * Master the most up-to-date practical skills and tools that data analysts use in their daily roles
* Learn how to visualize data and present findings using various charts in Excel spreadsheets and BI tools like IBM Cognos Analytics & Tableau
* Develop working knowledge of Python language for analyzing data using Python libraries like Pandas and Numpy, and invoke APIs and Web Services
* Gain technical experience through hands on labs and projects and build a portfolio to showcase your work

At the end of the program, you complete a real-world capstone project specifically designed to showcase your newly learned data analyst skills. |
| **Companies Offering Jobs in the respective trade** | These companies value hands-on, project-based learning and proven skills in Python, SQL, Excel, Tableau, Power BI, data visualization, and analytics best practices, skills that are central to the IBM Data Analyst Professional Certificate.* Systems Limited
* S&P Global
* Careem
* ibex. Pakistan
* Zameen.com
* Afiniti
* Contour Software
* Folio3
* Tkxel
* Arbisoft
* Netsol Technologies
* Qbatch
* CureMD
* Inbox Business Technologies
* Venturedive
* Jazz
* Freelancing
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| **Job Opportunities** | * Data Analyst
* Junior Data Analyst
* Business Intelligence (BI) Analyst
* Reporting Analyst
* Data Visualization Specialist
* Data Quality Analyst
* Market Research Analyst
* Operations Analyst
* Financial Data Analyst
* Customer Insights Analyst
* Research Assistant (Data-Driven Projects)
* Project Data Officer
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| **No of Students** |  25-30 |

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| **Learning Place** | Labs |
| **Instructional Resources** | The following link will be accessible for students once they are enrolled in the program:https://www.coursera.org/professional-certificates/ibm-data-analyst |
| **Scheme of Study** |

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| **Sr. No**  | **Main Topics**  | **Theory Hrs.** | **Practical Hrs.** | **Total Hrs.** |
| **1.** | **Introduction to Data Analytics** | **12** | **3** | **15** |
| **2.** | Excel Basics for Data Analysis / Data Visualization and Dashboards with Excel and Cognos | **4** | **11** | **15** |
| **3.** | Data Visualization and Dashboards with Excel and Cognos / Python for Data Science, AI & Development | **4** | **11** | **15** |
| **4.** | Python for Data Science, AI & Development | **4** | **11** | **15** |
| **5.** | Databases and SQL for Data Science with Python | **4** | **11** | **15** |
| **6.** | Databases and SQL for Data Science with Python / Data Analysis with Python | **4** | **11** | **15** |
| **7.** | Data Analysis with Python / Data Visualization with Python | **2** | **13** | **15** |
| **8.** | Data Visualization with Python / IBM Data Analyst Capstone Project | **2** | **13** | **15** |
| **9.** | IBM Data Analyst Capstone Project | **0** | **15** | **15** |
| **10.** | IBM Data Analyst Capstone Project / Generative AI: Enhance your Data Analytics Career | **4** | **11** | **15** |
| **11.** | Generative AI: Enhance your Data Analytics Career | **6** | **9** | **15** |
| **12.** | Data Analyst Career Guide and Interview Preparation | **8** | **7** | **15** |
| **Total** | **54** | **126** | **180** |

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| **Scheduled Week** | **Module Title** | **Day** | **Learning Units** | **Task** |
| Week 1/12 | Introduction to Data Analytics  | Day 1 | What is Data Analytics | Introduction to Visualization and Dashboarding Software |
| Day 2 | The Data Ecosystem |
| Day 3 | Gathering and Wrangling Data / Mining & Visualizing Data and Communicating Results |
| Day 4 | Career Opportunities and Data Analysis in Action |
| Day 5 | Introduction to Data Analysis Using Spreadsheets / Getting Started with Using Excel Spreadsheets |
| Week 2/12 | Excel Basics for Data Analysis / Data Visualization and Dashboards with Excel and Cognos | Day 1 | Cleaning & Wrangling Data Using Spreadsheets | Cleaning and preparing data, and then analyzing data using an Excel spreadsheet |
| Day 2 | Analyzing Data Using Spreadsheets |
| Day 3 | Final Project |
| Day 4 | Visualizing Data Using Spreadsheets |
| Day 5 | Creating Visualizations and Dashboards with Spreadsheets |
| Week 3/12 | Data Visualization and Dashboards with Excel and Cognos / Python for Data Science, AI & Development | Day 1 | Creating Visualizations and Dashboards with Cognos Analytics | Creating Visualizations Using Cognos Analytics |
| Day 2 | Final Project |
| Day 3 | Python Basics |
| Day 4 | Python Data Structures |
| Day 5 | Python Programming Fundamentals |
| Week 4/12 | Python for Data Science, AI & Development | Day 1 | Python Programming Fundamentals - Continued | Develop a data visualization project using Excel and Cognos Analytics |
| Day 2 | Working with Data in Python |
| Day 3 | Working with Data in Python – Continued |
| Day 4 | APIs and Data Collection |
| Day 5 | APIs and Data Collection – Continued |
| Week 5/12 | Databases and SQL for Data Science with Python | Day 1 | Getting Started with SQL | Web Scraping / Working with different file formats |
| Day 2 | Introduction to Relational Databases and Tables |
| Day 3 | Intermediate SQL |
| Day 4 | Accessing Databases using Python |
| Day 5 | Course Assignment |
| Week 6/12 | Databases and SQL for Data Science with Python / Data Analysis with Python | Day 1 | Advanced SQL for Data Engineers | Practice Querying Real World Datasets |
| Day 2 | Importing Data Sets |
| Day 3 | Data Wrangling |
| Day 4 | Exploratory Data Analysis |
| Day 5 | Model Development |
| Week 7/12 | Data Analysis with Python / Data Visualization with Python | Day 1 | Model Evaluation and Refinement | Data Analytics for House Pricing Data Set |
| Day 2 | Final Assignment |
| Day 3 | Introduction to Data Visualization Tools |
| Day 4 | Basic and Specialized Visualization Tools |
| Day 5 | Advanced Visualizations and Geospatial Data |
| Week 8/12 | Data Visualization with Python / IBM Data Analyst Capstone Project | Day 1 | Creating Dashboards with Plotly and Dash | Create Visualizations using Matplotlib, Seaborn & Folium |
| Day 2 | Creating Dashboards with Plotly and Dash – Continued |
| Day 3 | Final Project |
| Day 4 | Exam |
| Day 5 | Data Collection |
| Week 9/12 | IBM Data Analyst Capstone Project | Day 1 | Data Wrangling | Exploratory Data Analysis |
| Day 2 | Data Wrangling – Continued |
| Day 3 | Exploratory Data Analysis |
| Day 4 | Data Visualization |
| Day 5 | Data Visualization – Continued |
| Week 10/12 | IBM Data Analyst Capstone Project / Generative AI: Enhance your Data Analytics Career | Day 1 | Data Visualization – Continued | Complete the IBM Data Analyst Capstone Project and present your findings |
| Day 2 | Building A Dashboard |
| Day 3 | Final Assignment: Present Your Findings |
| Day 4 | Final Assignment: Present Your Findings - Continued |
| Day 5 | Data Analytics and Generative Al |
| Week 11/12 | Generative AI: Enhance your Data Analytics Career  | Day 1 | Data Analytics and Generative Al – Continued | Guided Practice Project |
| Day 2 | Use of Generative Al for Data Analytics |
| Day 3 | Use of Generative Al for Data Analytics - Continued |
| Day 4 | Final Project |
| Day 5 | Exam |
| Week 12/12 | Data Analyst Career Guide and Interview Preparation |  Day 1 | Build a Foundation | Python Exercise for Introductory Data Analysis |
| Day 2 | Applying and Preparing to Interview |
| Day 3 | Interviewing |
| Day 4 | Mock Interviews |
| Day 5 | Course Wrap-up |

List of Machinery / Equipment

1. **Software List**

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| --- | --- |
| **Sr. No** | **Software Name** |
| 1. | MS Office(Installed on each PC) |
| 2. | Operating System (Windows, Linux or other Operating Systems) |
| 3. | Programming Languages including PyCharm, Notebook |

1. **Minimum Qualification of Teachers / Instructor**

The qualification of teachers / instructor of this course should be a minimum of bachelor’s in computer science / software engineering with minimum 3 years of development experience in relevant trade.

1. **Eligibility for the trainees:**

As defined by NAVTTC

1. **List of Machinery/Equipment**

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| **Sr. No** | **Name of item as per curriculum** | **Quantity physically available at the training location** |
| 1 | Computers Minimum Core-i5 8th Generation* LCD Display 17” with built in speakers
 | 25 |
| 2 | DSL Internet Connection (Minimum 5 MB) | Available on every PC |
| 3 | **Accessories/Devices*** Connectors
* Multimedia
* Audio/visual aid
* White Board
* Flip Chart Board
 | 25 each |
| 4 | **Wires, data cables, power plugs, power supply** | For every PC |
| 5 | **UPS** | Available |
| 6 | **Generator / Solar Backup** | Available |
| 7 | **Air Conditioner (2 Tons)** | Available |