Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister Youth Skills Development Program

"Skills for All"

Course Contents / Lesson Plan
Course Title: Microsoft Power BI and Data Analyst Professional Certificate
Duration: 2 Months

Trainer Name	
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Course Title	**Microsoft Power BI and Data Analyst Professional Certificate**
Objectives and Expectations	**Employable skills and hands-on practice on MS Power BI Software** **Objective:** This program will enable you to master the key functions, tools, and features of Microsoft Power BI, elevating your data analysis and visualization skills from basic to advanced levels. With Microsoft Power BI, you can efficiently store, analyze, and visualize large datasets. Learn these transformative technologies to effortlessly analyze extensive business data. **Expectations:** **i.** **Develop Data Analysis Skills:** Participants learn and practice to gather, clean, and transform data from various sources. Acquire proficiency in data modeling, which includes understanding relationships, creating calculated columns, measures, and more. **ii.** **Strong and Impact Visualization of Data**: Participant will be able to visualize data through the creation of interactive dashboards and reports. **iii.** **Provide hands-on experience**: in using Power BI features like Power Query, DAX (Data Analysis Expressions), and Power BI Service. **iv.** **Enhance Decision-Making:** Participants will be able to interpret and analyze data to make and facilitate informed business decisions. The course will improve the ability of participants to identify trends, patterns, and insights from data that can drive business strategies. **Employable Skills:** **i.** **Prepare for Data Analyst Roles**: The course will equip learners with the competencies needed to perform as a data analyst in various industries through; a. Ability to create and manage data models, including defining relationships, creating calculated columns, and measures. b. Understanding of how to structure data for optimal analysis c. Acquired competence in using Data Analysis Expressions (DAX) to perform complex calculations and analyses. d. Ability to identify trends, patterns, and insights from data to support business decisions. e. Learning skills in choosing the right visualizations to effectively communicate data insights. **ii.** **Business Intelligence:** Participants will gain ability to translate business requirements into technical solutions using Power BI and developing an understanding of how to use data to inform and drive business strategies.

	iii. **Report Automation and Sharing:** Participants will be proficient in automating report generation and sharing insights with stakeholders through Power BI Cloud Service. iv. **Problem-Solving:** Participants will acquire enhanced problem-solving abilities to analyze, identify and develop solutions through the application of data driven analytics. v. **Self Employment**: Training will make participants to explore and work on independent data analytical and visualization projects offered online by various clients. vi. **Team Collaboration:** Collaborative projects and group activities will foster teamwork and communication skills, preparing participants for collaborative work environments. vii. **Continuous Learning:** The course will instill a mindset of continuous learning, essential in the fast-paced field of technology, where new tools and frameworks regularly emerge. **Hands-on Practice:** i. **Data Collection and Importing:** Practice importing data from Excel, CSV, databases (SQL Server, Azure), and cloud-based sources. Hands-on exercises in cleaning, transforming, and merging datasets using Power Query Editor. ii. **Data Modeling:** Building and managing data models, including setting up relationships between tables. Practice creating calculated columns and measures using DAX (Data Analysis Expressions). iii. **Data Analysis:** Exercises on using DAX functions for filtering, aggregating, and performing complex calculations on data. Working with time-based data to create YTD (Year-to-Date), MTD (Month-to-Date), and other time-related measures. iv. **Data Visualization:** Creation of interactive reports and dashboards using various visualizations like bar charts, pie charts, maps, and gauges. Practice using and implementing custom visuals from the Power BI marketplace or designing custom visualizations. v. **Report Automation:** Setting up and managing scheduled refreshes for datasets in Power BI. vi. **Assignment Reviews and Feedback:** Regular assignment reviews and feedback sessions will provide participants with constructive criticism to improve their learning and development skills.
Entry-level of trainees	Minimum 16 year of education, having: • Strong understanding of MS Excel. • Familiarity with computer systems.
Learning Outcomes of the course	**Set Yourself Apart as MS Power BI Expert** • Gain advanced skills in Excel and Power BI to stand out as a top data analysis and visualization expert. **Demonstrate Data Analysis & Reporting Mastery at the Workplace** • Showcase your ability to deliver actionable insights and professional reports that drive business decisions. **Build Credibility Through Proof of Skills**

	• Establish your expertise with a portfolio of real-world projects that validate your proficiency. **Possess Professional Credentials** • Obtain a respected certification that enhances your career prospects and professional credibility.
Course Execution Plan	The total duration of the course: **2 months (8 Weeks)** Class hours: **4 hours per day** Theory: **20%** Practical: **80%** Weekly hours: **20 hours per week** Total contact hours: **160 hours**
Companies offering jobs in the respective trade	• Microsoft • Coca-Cola • Nestlé • Rolls-Royce • BP (British Petroleum) • Procter & Gamble • GE Healthcare • Adobe • Heineken • Toyota • Walmart • T-Mobile • Unilever • Meijer • Capgemini • EY (Ernst & Young) • Dell Technologies • Siemens • Metro Bank • Suncor Energy
Job Opportunities	• Manufacturing Sector • Sales and Distribution Sector • Services sector • Financial Services • Telecommincation • Logistic services • Public sector organizations • NGOs • Self employment at various online platform
No of Students	25
Learning Place	Classroom / Lab
Instructional Resources	**Online Courses and Tutorials:** 1. **Microsoft Power BI Data Analyst**: https://learn.microsoft.com/en-us/training/courses/pl-300t00

	2. **Microsoft Power BI Data Analyst Professional Certificate:** https://www.coursera.org/professional-certificates/microsoft-power-bi-data-analyst#courses **Books and References:** 1. Mastering Microsoft Power BI: Expert techniques for effective data analytics and business intelligence: https://www.amazon.com/s?k=9781788297233&i=stripbooks&linkCode=qs 1. Beginning Microsoft Power BI: A Practical Guide to Self-Service Data Analytics by Dan Clark: https://www.amazon.com/s?k=9781484256206&i=stripbooks&linkCode=qs **Software:** 1. **Power BI Desktop:** https://www.microsoft.com/en-us/power-platform/products/power-bi/desktop#Resources

MODULES

Scheduled Weeks	Module Title	Learning Units	Home Assignment

Week 1	**Prepare Data for Analysis with Microsoft Excel**	• Learn excel Fundamentals
		• Apply formula and Functions
		• Prepare data for analysis using functions
		  ○ Logical
		  ○ Arithmetic
		  ○ Statistical
		  ○ Date
		• Work with Power Query and Data Models
			Add, sort, filter data in Excel sheet
			
			Use logical and date function to prepare data set

Week 2	**Extract, Transform and Load Data in Power BI**	• Learn data Sources in Power BI
		  ○ Data sources File and SQL
		  ○ Structured vs. unstructured data
		  ○ Storage
		• Transform data in Power BI
		  ○ Power Query
		  ○ Unpivot and pivot columns
		  ○ Append tables
		  ○ Merge tables
			Set up an Excel data source
			
			Append two tables
			
			Merge two data source

Week 3	**Extract, Transform and Load Data in Power BI**	• Learn and apply advanced ETL in Power BI
		  ○ Loading data
		  ○ Staging Area
		  ○ Profiling Data in Power BI
		  ○ Dataflows
		  ○ Reference queries
			Profile a dataset

	Data Modeling in Power BI	• Learn concept of Data Modeling
		  ○ Flat schema
		  ○ Understanding fact and dimension tables
		  ○ Cardinality
		  ○ Granularity
		  ○ Star and Snowflake schema
			Configure a Flat schema with multiple sources
			
			Change Star schema into a Snowflake schema

		○ Normalization and denormalization ○ Managing model relationships	
Week 4	**Data Modeling in Power BI**	• Data Analysis Expression (DAX) ○ Introduction to DAX ○ DAX functions ○ DAX operators ○ References to model objects ○ Constant values ○ DAX variables ○ Whitespace Row ○ DAX table functions ○ Context and filter context • Create calculated columns	**Add a calculated table and column**
Week 5	**Data Modeling in Power BI**	• Create measures ○ Quick measures ○ Custom measures with DAX • CROSSFILTER function • Role-playing dimensions • Time intelligence function ○ Using DAX for summarization over time ○ Using DAX for comparison over time • Create common date table ○ Using DAX ○ With M and Power Query • Optimize Data Model Performance ○ Identifying and reducing cardinality levels ○ Optimizing DirectQuery performance ○ Aggregation	**Add a role-playing dimension** **Use time intelligence to compare to previous year** **Set up a common date table**

Week 6	**Data Analysis and Visualization with Power BI**	• Create Visualizations
		  ○ Table visualization
		  ○ Bar and column charts
		  ○ Line and area charts
		  ○ Combo charts
		  ○ Pie and donut charts
		  ○ Treemaps
		  ○ Displaying Key Performance Indicators
		  ○ Ribbon and waterfall charts
		  ○ Funnel charts
		  ○ Scatter charts
		• Navigation and Accessibility
		  ○ Formatting and configuring visualizations
		  ○ Themes and Custom tooltips
		  ○ Hierarchies, drill through
		  ○ Cross Filters and Slicers
			Create a sales report Using bars, columns, and lines

Week 7	**Creative Designing in Power BI**	• Visualization and design
		  ○ Color theory
		  ○ Positioning and density of information
		  ○ Chaotic versus cohesive pages
		• Designing powerful report pages
		  ○ Creating and formatting a KPI Chart
		  ○ Shape Map Visuals
		  ○ Choropleth maps
		• Creating dashboard and Storytelling
		• Publishing reports and dashboards
			Create an interactive dashboard using hierarchies, filters and slicers

Week 8	**Prepare, Desing and**	• Report Types
		  ○ Dashboard
		  ○ Analytical
			Apply sensitivity labels

	Publish Report	○ Operational ○ Educational ○ Interface of report • Creating a dynamic report ○ What-if parameters • Creating and managing Workspace ○ Shared workspace • Security and monitoring ○ Data sensitivity labels ○ Dataset permissions ○ Configuring data alerts	**Configure a data alert**
	Apply learning of the course to develop report and dashboard as data analyst.	**Final Project Presentations and Graduation** • Each student presents their final project • Graduation ceremony and distribution of certificates	
	Prepare data model from various data sources, add calculated columns using DAX functions and prepare dashboard report.	• Create a data set by appending and merging data from various data sources and applying relevant schema to data model. • Create column using quick and custom calculations using DAX functions • Use time intelligence to compare to previous year • Create dashboard for publishing along with assigned permissions	**Final Exam**

Practical Tasks:

	Task	Description	Week
1	**Prepare Data for Analysis with Microsoft Excel**	● Apply formulas and functions in Excel to explore the importance of data analysis. ● Learn Basic techniques for data extraction and preparation	Week 1
2	**Extract, Transform and Load Data in Power BI**	● Set up a data source, explaining and configuring storage modes in Power BI. ● Prepare for data modeling by cleaning and transforming data.	Week 2 & 3
3	**Data Modeling in Power BI**	● Use profiling tools to identify data anomalies. ● Reference queries and dataflows and use the Advanced Editor to modify code. ● Form a model using a Star Schema. ● Write calculations DAX to create elements and analysis in Power BI. ● Write calculations DAX to create elements and analysis in Power BI. ● Optimize performance in a Power BI model.	Week 3, 4 & 5
4	**Data Analysis and Visualization with Power BI**	● Add visualizations to reports and dashboards. ● Design accessible reports and dashboards. ● Use visualizations to perform data analysis.	Week 6
5	**Creative Designing in Power BI**	● Create compelling and cohesive reports and dashboards. ● Work in detail with specialist chart visualizations.	Week 7
6	**Prepare, Desing and Publish Report**	● Create and publish a report and dashboard. ● Implement dynamic reports. ● Implement security measures and alerts.	Week 8

Annexure-IV:

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. **Attendance:**
   Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.
2. **Character:**
   Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.
3. **Team Work:**
   The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.
4. **Appearance:**
   Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime
5. **Attitude:**
   Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.
6. **Productivity:**
   Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.
7. **Organizational Skills:**

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. **Communication:**

   Written communication, being able to correctly write reports and memos. Verbal communications, being able to communicate one on one or to a group.

9. **Cooperation:**

   Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

10. **Respect:**

    Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.