Government of Pakistan

**National Vocational and Technical Training Commission**

**Prime Minister Youth Skills Development Program**

"Skills for All"



**Course Contents / Lesson Plan**

**Course Title: Tableau**

**Duration:** 1 Month

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| **Author Name** |  |
| **Course Title** | **Tableau** |
| Objectives and Expectations | **Employable skills and hands-on practice in Tableau**  **Understanding Tableau Basics:**   * Learn the basic concepts of Tableau, including data connection, dimensions, measures, and the Tableau workspace.   **Data Preparation and Cleaning:**   * Acquire skills in preparing and cleaning data for analysis in Tableau. Learn to work with different data sources and formats.   **Creating Visualizations:**   * Master the creation of various visualizations like bar charts, line charts, scatter plots, and maps. Understand the purpose and use case of each type.   **Dashboard Creation:**   * Learn to design and build interactive dashboards that effectively communicate insights. Understand how to arrange and organize elements on a dashboard.   **Data Blending and Joins:**   * Gain proficiency in data blending and performing joins to combine data from multiple sources for comprehensive analysis.   **Calculated Fields and Formulas:**   * Explore the creation of calculated fields and formulas to derive new insights and metrics from existing data.   **Advanced Visualizations:**   * Explore advanced visualizations like heatmaps, treemaps, and box plots. Understand when and how to use them effectively.   **Mapping and Geospatial Analysis:**   * Master geospatial analysis in Tableau, including map creation, customization, and analysis of location-based data.   **Storytelling with Data:**   * Develop the skill of storytelling through data visualization. Learn how to create a compelling narrative using Tableau to convey insights effectively.   **Integration with Other Tools:**   * Explore integration with other tools and platforms, such as Excel, SQL, and cloud-based data storage solutions.   **Main Expectations:**  **Regular Practice:**   * Dedicate regular time to practice Tableau. Create sample projects and analyze datasets to reinforce your learning.   **Project-Based Learning:**   * Undertake real-world projects or case studies to apply your Tableau skills. This could be personal projects or contributions to open-source datasets.   **Community Engagement:**   * Join Tableau communities, forums, or user groups to engage with other learners and professionals. Share your work, seek feedback, and learn from others.   **Networking:**   * Attend Tableau events, webinars, or networking sessions to connect with professionals in the field. Networking can open up opportunities for collaboration or job prospects.   **Portfolio Development:**   * Build a portfolio showcasing your Tableau projects. This can serve as a tangible demonstration of your skills for potential employers.   **Motivational Lectures**  The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture. To inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:   * Clear Purpose to convey the message to trainees effectively. * Personal Story to quote as an example to follow. * Trainees Fit so that the situation is actionable by trainees and not represent a just idealism. * Ending Points to persuade the trainees on changing themselves.   A good motivational lecture should help drive creativity, curiosity, and spark the desire needed for trainees to want to learn more.  The impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees’ willingness to be engaged on the practical tasks for a longer time without boredom and loss of interest because they can see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10 years).  As this tool is expected that the training providers would make arrangements for regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.  Course-related motivational lectures online link is available in **Annexure-II**.   1. **Success Stories**   Another effective way of motivating the trainees is using Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till the end of the training.  A success story may be disseminated orally, through a presentation, or using a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person achieved his goal through hard work, dedication, and devotion. An inspiring success story contains compelling and significant facts articulated clearly and easily comprehendible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. The optimum impact is created when the story is revealed in the form of:-   * Directly in person (At least 2-3 cases must be arranged by the training institute) * Through an audio/ videotaped message (2-3 high-quality videos must be arranged by the training institute)   It is expected that the training provider would collect relevant high-quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document.  The suggestive structure and sequence of a sample success story and its various shapes can be seen in **Annexure III**.   1. **Case Studies**   Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real-life specific problem/situation and to explore the solutions.  In simple terms, the case study method of teaching uses a real-life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in discussions and thereby boost their confidence. It also makes the classroom atmosphere interesting thus maintaining the trainee interest in training till the end of the course.  Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies be presented to the trainees. The trainer may adopt a PowerPoint presentation or video format for such case studies whichever is deemed suitable but only those cases must be selected that are relevant and of a learning value.  The Trainees should be required and supervised to carefully analyze the cases.  For this purpose, they must be encouraged to inquire and collect specific information/data, actively participate in the discussions, and intended solutions to the problem/situation.  Case studies can be implemented in the following ways: -   1. A good quality trade-specific documentary ( At least 2-3 documentaries must be arranged by the training institute) 2. Health &Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute) 3. Field visits( At least one visit to a trade-specific major industry/ site must be arranged by the training institute) |
| Entry-level of trainees | Tableau course of proposed entry level is minimum bachelor’s Degree in mathematics, computer science, information systems, or related field, so expectations from the trainees are:   * Basics Understanding of SQL * Fundamentals of script programming. * Understanding of data modeling, warehousing, and ETL processes. * Data Preparation and Cleaning. |
| **Learning Outcomes of the course** | The content of this lesson plan is adopted from the internationally recognized ISTQB certification course, "Certified Tester Foundation Level (CTFL)," ensuring alignment with global standards and practices.  For further reference, the link to the source material is provided below: Understanding  **Data Visualization:**   * Explain the importance of visualizing data for analysis and decision-making.   **Tableau Basics:**   * Navigate the Tableau interface with confidence. * Demonstrate a clear understanding of the basic features and functions of Tableau.   **Data Connection and Preparation:**   * Connect Tableau to various data sources (e.g., Excel, CSV) and understand the basics of data preparation.   **Visualization Techniques:**   * Create basic visualizations such as bar charts, line charts, and scatter plots. * Utilize colors, labels, and tooltips effectively in visualizations.   **Skills Development:**  **Building Dashboards:**   * Create simple dashboards with multiple visualizations and interactive elements.   **Data Manipulation:**   * Apply basic data manipulation techniques, including filtering and sorting.   **Calculated Fields and Formulas:**   * Create calculated fields and basic formulas to derive new insights from data.   **Mapping and Geospatial Analysis:**   * Create maps in Tableau and perform basic geospatial analysis.   **Practical Application:**  **Hands-on Experience:**   * Apply Tableau skills through hands-on exercises and a mini-project. * Demonstrate the ability to solve real-world problems using Tableau.   **Project Presentation:**   * Present the completed mini-project, showcasing effective use of Tableau for data visualization and analysis.   **Problem-Solving and Decision-Making:**  **Analytical Thinking:**   * Apply analytical thinking to interpret visualized data and draw meaningful conclusions.   **Decision Support:**   * Understand how Tableau can be used to support decision-making processes.   **Continuous Learning:**  **Resource Utilization:**   * Collaborate effectively with peers on group activities and projects.   **Communication Skills:**   * Communicate findings and insights using Tableau visualizations in a clear and concise manner.   **Self-Assessment:**   * Reflect on personal progress, identify areas of improvement, and set goals for ongoing skill development in Tableau. |
| **­­­Course Execution Plan** | The total duration of the course: **1 months (4 Weeks)**  Class hours: **4 hours per day**  Theory: **20%**  Practical: **80%**  Weekly hours: **20 hours per week**  Total contact hours: **80 hours** |
| **Companies offering jobs in the respective trade** | * Avanceon Middle East & South Asia Lahore * Afinity * NetSole * I2c * Nisum * Transworld * Netcom * Systems * Purelogics * ENTERTAINER FZ |
| **Job Opportunities** | * IT and Software Development Companies: * Consulting Firms: * Financial Services: * Healthcare Organizations: * E-commerce and Retail: |
| **No of Students** | 25 |
| **Learning Place** | Classroom / Lab |
| **Instructional Resources** | 1. Introduction to [https://www.youtube.com/watch?v=VUVqj7YsWmU](https://www.youtube.com/watch?v=VUVqj7YsWmU%20) 2. Tableau Crash Course in Urdu: https://www.youtube.com/watch?v=Chc2ZAE-xWA&list=PL5rtO8eskhSxoAGv\_7N592ngl7zeiAKGu 3. Tableau full course from Website: <https://www.tableau.com/learn/training> 4. Get Tableau Certified Kick your career into high gear   SCHEDULE YOUR EXAM NOW  https://www.tableau.com/learn/certification |

**MODULES**

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| **Scheduled Weeks** | **Module Title** | **Days** | | **Hours** | **Learning Units** | **Home Assignment** | |
| **Week 1** | **Introduction to Tableau and Basic Visualization Techniques** | Day 1 | | Hour 1 to 4 | * Introduction to Tableau * Overview of data visualization and Tableau * Installing and setting up Tableau Desktop * Navigating the Tableau interface |  | |
| Day 2 | | Hour 1 to 4 | * **Connecting to Data and Building First** Visualizations * Connecting to different data sources * Understanding dimensions and measures * Creating basic visualizations (bar charts, line charts) |
| Day 3 | | Hour 1 to 4 | * **Data Manipulation and Filters** * Data blending and joins * Basic data manipulation techniques * Implementing filters and sorting |
| Day 4 | | Hour 1 to 4 | * **Advanced Visualization Techniques** * Creating additional visualizations (scatter plots, pie charts) * Customizing visualizations (colors, labels, tooltips) |
| Day 5 | | Hour 1 to 4 | * **Dashboard Creation** * Introduction to dashboards * Building a simple dashboard with multiple visualizations * Review and Q&A session |
| **Week 2** | **Advanced Visualization and Data Preparation** | Day 1 | Hour 1 to 4 | | * **Calculated Fields and Formulas** * Creating calculated fields for custom analysis * Introduction to basic mathematical and logical functions | |  |
| Day 2 | Hour 1 to 4 | | * **Mapping and Geospatial Analysis** * Creating maps in Tableau * Analyzing geographical data * Practical exercises with geospatial visualizations | |
| Day 3 | Hour 1 to 4 | | * **Advanced Dashboard Features** * Implementing interactive elements with parameters * Using actions and highlighting for better interactivity | |
| Day 4 | Hour 1 to 4 | | * **Review and Project Work** * Review of concepts learned so far * Project-based exercises to reinforce skills | |
| Day 5 | Hour 1 to 4 | | **Mini-Project Presentation**   * Presentation of mini-projects by participants * Feedback and Q&A session | |
| **Week 3** | **Data Preparation and Cleaning** | Day 1 | Hour 1 to 4 | | * **Data Cleaning Basics** * Handling missing data * Removing duplicates and outliers | |  |
| Day 2 | Hour 1 to 4 | | **Joining Tables and Advanced Data Manipulation**  Advanced techniques for joining tables   * Working with multiple data sources | |
| Day 3 | Hour 1 to 4 | | Data Blending and Advanced Calculations  Deeper exploration of data blending   * Advanced calculations for in-depth analysis | |
| Day 4 | Hour 1 & 2 | | **Case Studies and Practical Applications**  Analyzing real-world case studies   * Applying Tableau skills to solve practical problems | |
| Day 5 | Hour 1 & 2 | | **Review and Project Work**  Review of concepts covered in Week 3   * Project-based exercises to enhance data preparation skills | |
| **Week 4** | **Advanced Features and Best Practices** | Day 1 | Hour 1 to 4 | | **Best Practices in Tableau**  Tips for efficient data visualization   * Common pitfalls to avoid | |  |
| Day 2 | Hour 1 to 4 | | **Integration with Other Tools**  Working with Excel, SQL, and cloud-based data storage   * Exploring Tableau integration capabilities | |
| Day 3 | Hour 1 to 4 | | **Advanced Visualizations**  Creating heatmaps, treemaps, and box plots   * Use cases for advanced visualizations | |
| Day 4 | Hour 1 to 4 | | **Storytelling with Data**  Developing storytelling skills through data visualization   * Creating compelling narratives in Tableau | |
| Day 5 | Hour 1 to 4 | | **Certification Preparation and Review**  Overview of Tableau certifications  Preparation tips and mock exams   * Final review and Q&A session | |

**Practical Task:**

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|  | **Task** | **Description** | **Week** |
| **1** | **Data Exploration:**  **.** | * Load the provided dataset into Tableau. * Explore the data to understand its structure, dimensions, and measures. | **Week 1** |
| **2** | **Basic Visualizations:** | * Create a bar chart to represent total sales across different product categories. * Build a line chart showing the trend of sales over time (if time-related data is available). | **Week 2** |
| **3** | **Data Manipulation and Filters:** | * Implement filters to allow users to analyze data for a specific time period or product category. * Apply data blending or joins if necessary to enhance the dataset for analysis. | **Week 3** |
| **4** | **Advanced Visualizations:** | * Develop a scatter plot to visualize the relationship between two key variables in the dataset. * Use pie charts to represent the distribution of sales among different customer segments. | **Week 4** |
| **5** | **Dashboard Creation:** | * Build a dashboard that integrates the visualizations created above. * Include interactive elements such as filters, highlighting, and parameters to enhance user experience. | **Final Term** |
| **6** | **Calculated Fields and Formulas:** | * Create calculated fields to derive new insights or perform custom analysis. * Use basic mathematical and logical functions to enhance data analysis. | **Final Term** |
| **7** | **Advanced Dashboard Features:**  **Data Cleaning and Joining Tables:** | * Implement advanced interactive elements using parameters and actions. * Showcase the ability to create a dynamic and user-friendly dashboard. * Demonstrate proficiency in handling missing data and removing duplicates or outliers. * Apply advanced techniques for joining tables and working with multiple data sources. | **Final Term** |

**Evaluation Criteria:**

Your project will be evaluated based on the following criteria:

Creativity and effectiveness of visualizations.

Proper utilization of Tableau features and functionalities.

Clarity and coherence of the storytelling narrative.

Attention to detail in data cleaning and manipulation.

Overall presentation and usability of the dashboard.

**Important Note:**

This is an individual project, and any form of plagiarism will result in disqualification. Ensure that the submitted work is your own and reflects the skills acquired during the Tableau course.

**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.

1. **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
2. **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.
3. **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.
4. **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.

1. **Communication:**Written communication, being able to correctly write reports and memos.  
   Verbal communications,being able to communicate one on one or to a group.
2. **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.
3. **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.