Data Analytics by Google:

Course Objectives	• Master data collection and integration techniques for gathering and combining data from various sources. • Ensure data quality by learning to clean, preprocess, and validate data for accuracy and consistency. • Conduct real-time data analysis using tools for immediate data processing and timely business decisions. • Utilize predictive analytics to forecast trends and develop proactive business strategies. • Enhance data visualization skills to create clear and impactful visualizations and dashboards. • Perform advanced data analysis to uncover actionable insights from complex datasets. • Optimize business operations by using data analytics to streamline processes and improve efficiency. • Support strategic decision-making through data-driven insights for informed planning and actions. • Improve customer knowledge by analysing data to enhance experiences and drive retention. • Ensure data governance and security by applying best practices for compliance and protection.
Course Outcomes	• Collect and integrate data from diverse sources effectively, ensuring data is ready for comprehensive analysis and decision-making. • Clean, preprocess, and validate data to maintain high data quality, ensuring accuracy and reliability for subsequent analysis. • Conduct real-time data analysis using appropriate tools, enabling timely and informed decision-making for business operations. • Apply predictive analytics techniques to forecast trends and develop proactive strategies, enhancing the ability to anticipate and respond to business challenges. • Create effective visualizations and dashboards that communicate data insights clearly and compellingly, supporting data-driven decisions. • Use data insights to optimize business processes, streamline

	operations, and support strategic planning, driving efficiency and effectiveness in business practices.

Course Duration: 45 Hours

Course Content:

UNIT I: Introduction to Data Analytics

Data acquisition - storage - processing and visualization - explore the architecture of Google Cloud-based tools - BigQuery - Cloud Storage

Lab Component & Outcome:

● Define the field of cloud data analysis and describe the roles and responsibilities of a cloud data analyst as they relate to data acquisition, storage, processing, and visualization.

● You'll explore the architecture of Google Cloud-based tools, like BigQuery and Cloud Storage, and how they are used to effectively structure, present, and report data.

UNIT II: Data Management and Storage

Data Lakehouse architecture - cloud components - Big Query, Google Cloud Storage, and DataProc

Lab Component & Outcome

● You'll explore how data is structured and organized. You'll gain hands-on experience with the data Lakehouse architecture and cloud components like Big Query, Google Cloud Storage, and DataProc to efficiently store, analyse, and process large datasets

UNIT III: Data Transformation in the Cloud

SQL - high volumes data - data pipeline - transformation strategies

Lab Component & Outcome

● Overview of the data journey, from collection to insights. You'll then learn how to use SQL to transform raw data into a usable format. Next, you'll learn how to transform high volumes of data with a data pipeline. Finally, you'll gain experience applying transformation strategies to real data sets to solve business needs.

UNIT IV: How to Visualize Data in the Cloud

Storytelling - planning - exploring data - building visualizations and sharing data

Lab Component & Outcome

● Focus on developing skills in the five key stages of visualizing data in the cloud: storytelling, planning, exploring data, building visualizations, and sharing data with others. You'll also gain experience using UI/UX skills to wireframe impactful, cloud-native visualizations and work with cloud-native data visualization tools to explore datasets, create reports, and build dashboards that drive decisions and foster collaboration.

UNIT V: Cloud Data Analyst

Cloud-based tools to acquire - store - process - analyze - visualize and communicate data

Lab Component & Outcome

● Full data lifecycle project, where you use cloud-based tools to acquire, store, process, analyse, visualize, and communicate data insights effectively.

● By the end of the course, you'll have completed a project demonstrating your proficiency in effectively structuring data from multiple sources, presenting solutions to varied stakeholders, and visualizing data insights using cloud-based software.

INDUSTRY USE CASE:

1. **Portfolio Website:** Creating a personal portfolio website to showcase skills, projects, and achievements.
2. **E-commerce Website:** Designing an online store with product listings, shopping cart functionality, and checkout process.
3. **Blog or Magazine Website:** Developing a content-focused website with articles, blog posts, and multimedia content.
4. **Corporate Website:** Designing a professional website for a business or organization, featuring company information, services, and contact details.
5. **Event Website:** Creating a website for promoting and managing events, including event details, registration forms, and schedules.
6. **Educational Website:** Developing an educational platform with courses, resources, and interactive learning materials.
7. **Creative Agency Website**: Designing a website for a creative agency or design studio, showcasing past projects and services offered.
8. **Healthcare Analytics:** Analysing patient data to improve diagnostics, treatment plans, and healthcare outcomes through predictive models and visual dashboards.
9. **Customer Segmentation**: Using advanced clustering techniques to group customers based on behaviour and demographics for targeted marketing strategies.
10. **Financial Fraud Detection:** Implementing machine learning algorithms to identify unusual patterns and detect fraudulent activities in financial transactions.

11. **Supply Chain Optimization:** Visualizing and analysing supply chain data to optimize inventory levels, reduce costs, and improve delivery times.
12. **Sales Forecasting:** Predicting future sales trends using time series analysis and visualizing sales data to guide business decisions.
13. **Sentiment Analysis:** Analysing social media and customer feedback to gauge public sentiment and visualize trends in customer opinion.
14. **Operational Efficiency:** Using data analytics to monitor and improve the efficiency of business operations, reducing waste and enhancing productivity.
15. **Market Basket Analysis:** Identifying associations between products purchased together and visualizing these relationships to optimize cross-selling strategies.
16. **Churn Prediction:** Developing models to predict customer churn and visualizing risk factors to create retention strategies.
17. **Energy Consumption Analysis:** Analysing and visualizing energy usage data to optimize consumption patterns and identify opportunities for cost savings.
18. **Risk Management:** Assessing and visualizing risk factors in various business processes to develop mitigation strategies and ensure compliance.
19. **Predictive Maintenance:** Analysing machine data to predict equipment failures and visualize maintenance schedules to minimize downtime.
20. **Personalized Marketing:** Using data analytics to create personalized marketing campaigns based on customer behaviour and preferences