DSSEC236 Power BI

Semester: III	Course Title: Power BI	Credit: 2
Course Code: DSSEC236		**Hours: 2/week**

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVEABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Recall key features and components of Power BI, including Power BI Desktop and Power Query.
CO2	UNDERSTANDING	Understand the process of importing, cleaning, transforming, and modeling data in Power BI.
CO3	APPLYING	Apply Power BI's visualization tools to create basic reports and dashboards.
CO4	ANALYSING	Analyze data using Power BI, including applying simple DAX functions for basic calculations.
CO5	EVALUATING	Evaluate reports and dashboards for data insights and presentation.
CO 6	CREATING	Create interactive reports and dashboards, using Power BI's visualization and interactivity features.

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	1	1	1	-
CO 2	2	1	-	1	-
CO 3	-	2	3	-	-
CO 4	1	1	2	2	1
CO 5	1	1	2	1	-
CO 6	1	1	2	3	1

Unit	Detailed Syllabus	Teaching Hours
I	**Introduction to Power BI and Data Preparation** • Overview of Power BI: Introduction to Power BI Desktop, Power BI Service, and Power BI Mobile. • Power BI Interface: Understanding the layout of Power BI Desktop, menus, ribbons, panes, and visualizations. • Connecting to Data Sources: Importing data from various sources like Excel, SQL Server, Web, and other databases. • Power Query: Using Power Query Editor to clean, transform, and load data. Basic transformations: filtering, sorting, merging, and appending queries.	15

	• Data Modeling: Creating relationships between tables (one-to-many, many-to-many), using primary and foreign keys. • Introduction to DAX (Data Analysis Expressions): Basic DAX concepts for calculated columns and simple measures (e.g., SUM, AVERAGE, COUNT). • Creating Visualizations: Building basic charts (bar, column, pie, line), tables, and cards. Customizing visualizations and using slicers. • Building Reports: Creating and formatting a basic report with multiple visualizations. Introduction to report design and layout best practices. • Integrate Power BI with Excel, R, Python	
II	**Practical Based on Unit-I** • Connecting to various data sources and importing data into Power BI. • Cleaning and transforming data using Power Query. • Building relationships between tables and creating a data model. • Writing basic DAX functions for data calculations. • Designing and formatting interactive reports with visuals and slicers. • Applying advanced DAX functions to create dynamic calculations. • Publishing reports to Power BI Service and sharing with peers. • Embedding Power BI reports in web applications. • Using Power BI Mobile to view and share dashboards.	30

Suggested Reference Books:

1. **Mastering Power BI** by Brett Powell, Wiley, 2020.
2. **Power BI for Dummies** by Mike Muller & Scott LePage, Wiley, 2021.
3. **The Definitive Guide to DAX** by Marco Russo & Alberto Ferrari, Microsoft Press, 2016.
4. **Power BI Cookbook** by Brett Powell, Wiley, 2017.

H.O.D
Dept of DATA SCIENCE & ANALYTICS
M.G. Science Institute, Ahmedabad-9.

DSSEC236 Tableau

Semester: III	Course Title: Tableau	Credit: 2
Course Code: DSSEC236		**Hours: 2/week**

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVEABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Recall key features and components of Tableau, including Tableau Desktop and Tableau Public.
CO2	UNDERSTANDING	Understand the process of importing, cleaning, transforming, and preparing data in Tableau.
CO3	APPLYING	Apply Tableau's visualization tools to create basic reports and dashboards.
CO4	ANALYSING	Analyze data using Tableau's features, including basic calculated fields and aggregations.
CO5	EVALUATING	Evaluate reports and dashboards for insights and effective presentation.
CO 6	CREATING	Create interactive dashboards using advanced Tableau functionalities and interactivity features.

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	1	1	-	-
CO 2	2	1	-	1	-
CO 3	-	2	3	-	-
CO 4	1	1	2	2	1
CO 5	1	1	2	1	-
CO 6	1	1	2	3	1

Unit	Detailed Syllabus	Teaching Hours
I	**Introduction to Tableau and Data Preparation** • Overview of Tableau: Introduction to Tableau Desktop, Tableau Public, and Tableau Online. • Tableau Interface: Understanding Tableau Desktop interface, shelves, cards, and dashboards. • Connecting to Data Sources: Importing data from Excel, databases (e.g., SQL Server), and cloud-based sources. • Data Preparation: Cleaning, merging, pivoting, and splitting data using Tableau Prep Builder. • Data Relationships: Managing data joins, blending, and relationships between tables.	15

	• Calculated Fields: Creating basic calculated fields for metrics and KPIs. • Basic Visualizations: Building charts like bar, line, scatter plots, and heat maps. • Dashboards and Stories: Introduction to creating dashboards and stories for data presentation. • Sharing and Publishing: Exporting dashboards and publishing them to Tableau Public or Tableau Online.	
II	**Practical Based on Unit-I** • Connecting to multiple data sources and importing datasets into Tableau. • Preparing data using Tableau Prep Builder: cleaning, merging, and reshaping data. • Creating relationships and blending data between tables. • Building visualizations: bar, line, scatter plots, and geographical maps. • Writing basic calculated fields and applying aggregations. • Designing and formatting dashboards with interactivity (filters, parameters, and actions). • Using advanced Tableau features such as table calculations and trend analysis. • Publishing and sharing dashboards on Tableau Online/Public. • Embedding Tableau dashboards into web applications or presentations.	30

Suggested Reference Books:

1. Learning Tableau by Joshua N. Milligan, Packt Publishing, 2020.
2. Tableau Your Data! by Daniel G. Murray, Wiley, 2021.
3. The Big Book of Dashboards by Steve Wexler, Jeffrey Shaffer, and Andy Cotgreave, Wiley, 2017.
4. Practical Tableau by Ryan Sleeper, O'Reilly Media, 2018.
5. Tableau Prep Up & Running by Joshua N. Milligan, Packt Publishing, 2019.

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DSSEC236 Numerical Methods for data Science

Semester: III	Course Title: Numerical Methods for data Science	Credit: 2
Course Code: DSSEC236		Hours: 2/week

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVEABILITIES	COURSE OUTCOMES
CO1	REMEMBERING	Recall key concepts of numerical analysis and types of errors.
CO2	UNDERSTANDING	Understand root-finding methods and interpolation techniques.
CO3	APPLYING	Apply root-finding and interpolation methods to solve problems.
CO4	ANALYSING	Analyze the convergence and effectiveness of numerical methods for solving systems of equations.
CO5	EVALUATING	Evaluate accuracy and errors in numerical solutions.
CO6	CREATING	Create solutions using a combination of numerical methods for real-world applications.

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	1	1	-	-
CO 2	2	1	-	1	-
CO 3	-	2	3	-	-
CO 4	1	1	2	2	1
CO 5	1	1	2	1	-
CO 6	1	1	2	3	1

Unit	Detailed Syllabus	Teaching Hours
I	**Fundamentals of Numerical Analysis** • Introduction to Numerical Analysis • Role in Data Science and Machine Learning • Types of Errors: Absolute, Relative, and Truncation **Numerical Methods for Solving Equations** • Root-Finding Methods - Overview about Direct & Iterative methods • Bisection Method • Secant Method • Newton-Raphson Method	15

	Interpolation Techniques • Introduction to interpolation • Polynomial Interpolation Newton's Interpolation Newton's Divided Difference Interpolation Lagrange Interpolation **Solving System of Linear Equations** • Gaussian Elimination Method • Iterative Methods: Jacobi, Gauss-Seidel Method	
II	**Practical Based on Unit-I** • Calculate the absolute, relative, and truncation errors for an approximate solution to a function. • Apply the bisection method to determine the root of various equations. • Solve equations using the Newton-Raphson method. • Use the Secant method to find the root of an equation. • Solve a system of equations using Gaussian elimination. • Employ the Jacobi method to iteratively solve a system of linear equations, given an initial guess and a specified tolerance. • Solve a system of equations using the Gauss-Seidel method. • Perform Lagrange interpolation on a given set of data points to estimate the value of a function at a specified point outside the data set. • Use Newton's difference formulas for interpolating a function based on a given data set.	30

Reference Books:

1. Numerical Methods with C++ and MATLAB Programming by Nita H. Shah Publisher: PHI Learning Pvt. Ltd.
2. Computer-Oriented Numerical Methods by R.S. Salaria
   Publisher: Khanna Book Publishing Co.
3. Computer-Oriented Numerical Methods by V. Rajaraman, Prentice Hall of India.
4. Numerical Methods" by E. Balagurusamy
   Publisher: McGraw Hill Education

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M.G. Science Institute, Ahmedabad-9.