# PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

Kanuru, Vijayawada-520007

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

### III B. Tech – I Semester CSE (AI & ML)

### Data Visualization using Power BI

| Course Code | 20SA8555 | Year | III | Semester | I |
|---|---|---|---|---|---|
| Course Category | SOC | Branch | CSE(AI&ML) | Course Type | Practical |
| Credits | 2 | L-T-P | 1-0-2 | Prerequisites | Statistics |
| Continuous Internal Evaluation | - | Semester End Examination | 50 | Total Marks | 50 |

| Course Outcomes | | |
|---|---|---|
| Upon successful completion of the course, the student will be able to | | |
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| CO1 | Demonstrate experimental procedures through oral communication and submit comprehensive documentation reports. | L2 |
| CO2 | Apply data exploration and preparation techniques in Power BI to transform raw data into a structured format suitable for analysis. | L3 |
| CO3 | Analyze complex datasets using advanced exploration and visualization techniques in Power BI. | L4 |
| CO4 | Evaluate and select appropriate techniques for effective collaboration, sharing, and communication of visualizations and dashboards within organizations | L5 |

| Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Moderate, 1:Low) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 2 | | | | | | | | | 2 | | | | |
| CO2 | | | | | 3 | | | | | | | 2 | 2 | |
| CO3 | | 3 | | | | | | | | | | 2 | | |
| CO4 | | | | 3 | | | | | | | | 2 | | |

| Syllabus | | |
|---|---|---|
| **Expt No.** | **Contents** | **Mapped CO** |
| **1** | Explore Microsoft Power BI desktop:<br>i) Ribbon ii) canvas iii) pages tab iv) visualization pane v) Fields pane vi) Filters pane vii) Report view viii) Table view ix) Model view. | CO4 |
| **2** | Explore Microsoft Power BI desktop:<br>1. Connecting to data sources and Importing data from it.<br>2. Cleaning the data in the Power Query editor.<br>3. Creating a visual.<br>4. Creating a dashboard.<br>5. Publishing dashboard. | CO1 to CO4 |
| **3** | Create business report in power bi desktop using Sales Performance Analysis for the following information:<br>1. Import data from various sources.<br>2. Use Power Query for data cleaning and transformation.<br>3. Create relationships between tables.<br>4. Filter and slice your data and use drill-down capabilities for deeper analysis.<br>5. Build calculated columns and measures using DAX.<br>6. Create different types of charts, tables and Use slicers and filters effectively.<br>7. Design interactive dashboards.<br>8. Analyze the data to identify meaningful insights and make data driven decisions. | CO1 to CO4 |
| **4** | Create the visualization using Power BI for the Sales Performance Analysis.<br>1. Perform Exploratory Data Analysis: Univariate analysis, Bivariate analysis, Multivariate analysis.<br>2. Create summary Dashboard for the given information:<br>   a. Total sales by Date, State, Product Name, Quantity, Discount and Profit.<br>3. Create Power Bi report for Seasonal Sales. | CO1 to CO4 |
| **5** | Create Dashboards using Power BI for the E-Learning Analysis with the following information:<br>1. Create Academic Business Report - Summary<br>   a. Total learners.<br>   b. Number of courses offered.<br>   c. Course completion status (in %).<br>   d. Course Distribution across learners.<br>2. Create Academic Business Report – Geographical.<br>3. Create Academic Business Report - Learners Attributes.<br>   a. Create one on Age distribution & other on Qualification. | CO1 to CO4 |
| **6** | Create Dashboard using Power BI for the Health Care Data Analysis with the following information:<br>a. Create a new table visual to show number of people tested on each date.<br>b. Analyze people who aged 70 above having mortality rate greater than 0.5 against each continent.<br>c. Create a bar chart to show case gdp per capita against each location during the period dec 2019 to feb 2020. | CO1 to CO4 |

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| | d. Find out the number of new cases out of total cases in each location using a matrix visual.<br>e. Determine the cardiovas death rate and it's percentage in Asia in the month of january 2020 using a pie chart. | |
| 7 | Create Dashboard using Power BI for the Spots Data Analysis with the following information:<br>a. Prepare a rank ordered list of top 10 countries with most players. Which countries are producing the most numbers of footballers that plays at this level?<br>b. Plot the distribution of overall rating vs. age of players. Interpret what is the age after which a player stops improving?<br>c. Which type of offensive players tends to get paid the most: the striker, the right-winger, or the left-winger? Visualize through a scatter plot<br>d. Top 5 players for every preferred position in terms of overall as well as potential points. Who were the best in 2018? Who were destined to be the future superstars in that year? | CO1 to CO4 |
| 8 | Create Dashboard using Power BI for the Spots Data Analysis with the following information:<br>a. Which club(s) have the maximum share of players from England?<br>b. Which club(s) have the maximum share of players from Spain?<br>c. Which club(s) have the maximum share of players from Germany?<br>d. Are the wages of a player influenced by the potential of a player? Check it out for players with age Between 16 to 28? | CO4 |
| 9 | Create Dashboards and Reports using Power BI for the E-Commerce Data Analysis with the following information:<br>a. Import data from SQL database and use Power Query for data cleaning and transformation.<br>b. Create charts and Use slicers and filters effectively.<br>c. Use drill-down Capabilities and create relationships.<br>d. Create effective dashboards and reports for the given data set and analyze the data to identify meaningful insights and make data driven decisions. | CO1 to CO4 |
| 10 | **Capstone Project 1:** Financial Performance Analysis<br>Get data into Power BI, Data Cleaning and Preparation in the power query, create visualizations, create an interactive dashboard combining the above visualizations, Advanced Analysis Using DAX, Analyze the data to identify meaningful insights and make data driven decisions and Publish the dashboard to Power BI. | CO1 to CO4 |
| 11 | **Capstone Project 2:** Social Media Analysis<br>Get data into Power BI, Data Cleaning and Preparation in the power query, create visualizations, create an interactive dashboard combining the above visualizations, Advanced Analysis Using DAX, Analyze the data to identify meaningful insights and make data driven decisions and publish the dashboard to Power BI. | CO1 to CO4 |
| 12 | **Capstone Project 3:** Insurance Data Analysis<br>Get data into Power BI, Data Cleaning and Preparation in the power query, create visualizations, create an interactive dashboard combining the above visualizations, Advanced Analysis Using DAX, Analyze the data to identify meaningful insights and make data driven decisions and publish the dashboard to Power BI. | CO1 to CO4 |

| Learning Resources |
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| **Text Books** |
| 1. The definitive guide to Dax: Business intelligence with Microsoft Power BI, SQL Server Analysis Services and Excel, Alberto Ferrari and Macro Russo, Second Edition, 2020, Pearson Education. |
| 2. Mastering Microsoft Power BI: Expert techniques to create interactive insights for effective data analytics and business intelligence, Greg Deckler and Brett Powell, Second Edition, 2022, Packt Publishing. |
| **Reference Books** |
| 1. Microsoft Power BI Dashboards Step by Step, Errin O'Connor, First Edition, 2020, Person Education. |
| 2. Learning Microsoft Power BI - Jeremey Arnold, First Edition, 2022, O'Reilly. |
| **e- Resources & other digital material** |
| 1. Power BI guide: https://youtube.com/playlist?list=PLwIcJx1aSL1SeTJgPbFgf1V-5CfsV4l1l&si=jCijUQKRTPlv4JFu |
| 2. Power BI guide: Introducing DAX Video Course - SQLBI |