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DATA ANALYST COURSE CONTENT

S.no	Core Course	Course Content
1	**Fundamentals of Data Analyst**	1. What is Data Science 2. Need for Data Scientists 3. Foundation 4. Business Intelligence 5. Data Analysis 6. Data Mining 7. Machine Learning 8. Analytics 9. Data Science 10. Types of Analytics 11. DS across industries 12. DS across functions 13. Analytics Project Lifecycle 14. Data 15. Basis of Data Categorization 16. Types of Data 17. Data Collection
2	**Excel**	1. Introduction to Excel 2. Columns & Rows 3. Functionality Using Ranges. 4. Excel Basic & Advanced Formulae's 5. Data Analysis Using Excel 6. Pivot & Power Pivot 7. Spreadsheet Tools 8. Data Cleaning 9. Data Validation 10. Data Visualization Using Excel
3	**DATA BASE**	**Introduction to RDBMS** **Sub Language Commands** • Data Definition Language (DDL) • Data Retrieval Language (DRL) • Data Manipulation Language (DML) • Transaction Control Language (TCL) • Database Security and Privileges (DCL) **Introduction to SQL Database Object** • Oracle Pre Defined Datatypes • DDL Commands

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		• Create, Alter (add, modify, rename, drop)Columns, Rename, truncate, drop • DML-Insert, update, delete • DQL-SELECT Statements using WHEREclause • Comparison and Conditional Operators • Arithmetic and Logical Operators • Set Operators (UNION, UNION ALL, INTERSECT, MINUS) • Special Operators – IN (NOT IN), BETWEEN (NOT BETWEEN), LIKE (NOT LIKE), IS NULL (IS NOT NULL)
4	**Statistical**	**Descriptive & Inferential Statistics** 1. Turning Data into Information 2. Probability Distributions 3. Sampling Distributions 4. Confidence Intervals 5. Hypothesis Testing 6. Comparing Two Groups 7. Analysis of Variance (ANOVA) **Prediction Analytics** 1. Simple Linear Regression 2. Multiple Linear Regression 3. Model Adequacy Checking 4. Transformations 5. Diagnostics for Leverage and 6. influence 7. Polynomial Regression 8. Dummy Variables 9. Variables Selection and Model Building 10. Generalized Linear Models Autocorrelation **Applied Multivariate Analysis** 1. Measures of Central Tendency, Dispersion and Association 2. Multivariate Normal Distribution 3. Sample Mean Vector and Sample Correlation 4. Principal Components Analysis(PCA) 5. Factor Analysis 6. Discriminant Analysis **7.** MANOVA

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5	**R Programming**	**R Programming** 1. R Basics 2. Numbers, Attributes 3. Creating Vector 4. Mixing Objects 5. Explicit Coercion 6. Formatting Data Values 7. Matrices, List, Factors, Data Frames, 8. Missing Values, Names 9. Reading and Writing Data 10. Using Dput/DDump 11. Interface to the Outside world 12. Sub setting R objects 13. Vectorized Operations 14. Dates and Times 15. Managing Data Frames with the DPLYR 16. package 17. Control Structures 18. Functions 19. Lexical /Dynamic Scoping 20. Loop Functions 21. Debugging **Data Visualization in R** 1. Storytelling with Data 2. Principle tenets 3. Elements of Data Visualization 4. Infographics vs Data Visualization 5. Data Visualization & Graphical functions in R 6. Plotting Graphs 7. Customizing Graphical Parameters to improvise the plots 8. Various GUIs 9. Spatial Analysis 10. Other Visualization concepts
6	**Python**	1. Python Overview 2. About Interpreted Languages 3. Advantages/Disadvantages of Python pydoc 4. Starting Python 5. Interpreter PATH 6. Using the Interpreter 7. Running a Python Script 8. Python Scripts on UNIX/Windows, Editors and IDEs 9. Using Variables

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		10. Keywords 11. Built-in Functions 12. StringsDifferent Literals 13. Math Operators and Expressions 14. Writing to the Screen 15. String Formatting 16. Command Line Parameters and Flow Control **Sequences and File Operations** • Lists • Tuples • Indexing and Slicing • Iterating through a Sequence • Functions for all Sequences • Using Enumerate() • Operators and Keywords for Sequences • The xrange() function • List Comprehensions • Generator Expressions • Dictionaries and Sets
7	**Machine Learning Introduction**	1. ML Fundamentals 2. ML Common Use Cases 3. Understanding Supervised and Unsupervised Learning Techniques 4. Clustering 5. Similarity Metrics 6. Distance Measure Types: Euclidean, Cosine Measures 7. Creating predictive models 8. Understanding K-Means Clustering 9. Understanding TF-IDF, Cosine Similarity and their application to Vector Space Model 10. Case study 11. Implementing Association rule mining 12. Case study 13. Understanding Process flow of Supervised Learning Techniques 14. Decision Tree Classifier 15. How to build Decision trees 16. Case study 17. Random Forest Classifier 18. What is Random Forests 19. Features of Random Forest 20. Out of Box Error Estimate and Variable Importance 21. Case study 22. Naive Bayes Classifier 23. Case study 24. Project Discussion

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25. Problem Statement and Analysis
26. Various approaches to solving a Data Science Problem
27. Pros and Cons of different approaches and algorithms
28. Linear Regression
29. Case study
30. Logistic Regression
31. Case study
32. Text Mining
33. Case study
34. Sentimental Analysis
35. Case study

Power BI Or Tableau

- Power BI Introduction
- Data Visualization, Reporting
- Business Intelligence (BI), Traditional BI, Self-Serviced BI
- Cloud Based BI, On Premise BI
- Power BI Products
- Power BI Desktop (Power Query, Power Pivot, Power View)
- Flow of Work in Power BI Desktop
- Power BI Report Server, Power BI Service, Power BI Mobile Flow

Power Query

- Data Transformation, Benefits of Data Transformation
- Shape or Transform Data using Power Query
- Overview of Power Query / Query Editor, Query Editor User Interface The
- Ribbon (Home, Transform, Add Column, View Tabs)
- The Queries Pane, The Data View / Results Pane, The Query Settings Pane, FormulaBar
- Saving the Work
- Datatypes, Changing the Datatype of a Column Filter
- in Power Query
- Auto Filter / Basic Filtering
- Filter a Column using Text Filters
- Filter a Column using Number Filters
- Filter a Column using Date Filters
- Filter Multiple Columns

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- Remove Columns / Remove Other Columns
- Name / Rename a Column
- Reorder Columns or Sort Columns
- Add Column / Custom Column Split
- Columns
- Merge Columns
- PIVOT, UNPIVOT Columns
- Transpose Columns
- Header Row or Use First Row as Headers
- Keep Top Rows, Keep Bottom Rows Keep
- Range of Rows
- Keep Duplicates, Keep Errors
- Remove Top Rows, Remove Bottom Rows, Remove Alternative Rows
- Remove Duplicates, Remove Blank Rows, Remove Errors

Data Modeling

- Data Modeling Introduction
- Relationship, Need of Relationship
- Relationship Types / Cardinality in General
- One-to-One, One-to-Many (or Many-to-One), Many-to-Many
- AutoDetect the relationship, Create a new relationship, Edit existing relationships
- Make Relationship Active or Inactive
- Delete a relationship

DAX

- What is DAX, Calculated Column, Measures
- DAX Table and Column Name Syntax
- Creating Calculated Columns, Creating Measures Calculated
- Columns Vs Measures
- DAX Syntax & Operators

DAX Operators

- Types of Operators
- Arithmetic Operators, Comparison Operators, Text Concatenation Operator, Logical
- Operators

DAX Functions Types

- Date and Time Functions
- Text Functions
- Logical Functions
- Math & Statistical Functions

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- Filter Functions
- Time Intelligence Functions
- Date and Time Functions
- YEAR, MONTH, DAY
- WEEKDAY, WEEKNUM
- FORMAT (Text Function) à Month Name, Weekday Name
- DATE, TODAY, NOW
- HOUR, MINUTE, SECOND, TIME
- DATEDIFF, CALENDAR
- Creating Date Dimension Table
- Text Functions
- LEN, CONCATENATE (&)
- LEFT, RIGHT, MID UPPER, LOWER
- TRIM, SUBSTITUTE, BLANK

Logical Functions

- IF
- IFERROR SWITCH
- Math & Statistical Functions
- INT
- ROUND, ROUNDUP, ROUNDDOWN
- DIVIDE
- EVEN, ODD
- POWER, SIGN
- SQRT, FACT
- SUM, SUMX
- MIN, MINX
- MAX, MAXX
- COUNT, COUNTX
- AVERAGE, AVERAGEX
- COUNTROWS, COUNTBLANK

Filter Functions

- CALCULATE
- ALL
- RELATED
- Report View
- Report View User Interface
- Fields Pane, Visualizations pane, Ribbon, Views, Pages Tab, Canvas Visual

Interactions

- Interaction Type (Filter, Highlight, None)
- Visual Interactions Default Behavior, Changing the Interaction

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- Grouping and Binning Introduction
- Using grouping, Creating Groups on Text Columns
- Using binning, Creating Bins on Number Column and Date Columns
- Sorting Data in Visuals
- Changing the Sort Column, Changing the Sort Order
- Sort using column that is not used in the Visualization
- Sort using the Sort by Column button
- Hierarchy Introduction, Default Date Hierarchy
- Creating Hierarchy, Creating Custom Date Hierarchy
- Change Hierarchy Levels
- Drill-Up and Drill-Down Reports
- Data Actions, Drill Down, Drill Up, Show Next Level

Visualizations

- Visualizing Data, Why Visualizations
- Visualization types, Create and Format Bar and Column Charts
- Create and Format Stacked Bar Chart Stacked Column Chart Create
- and Format Clustered Bar Chart, Clustered Column Chart
- Create and Format 100% Stacked Bar Chart, 100% Stacked Column Chart CreateandFormat Pie and Donut Charts
- Create and Format Scatter Charts
- Create and Format Table Visual, Matrix Visualization
- Line and Area Charts
- Create and Format Line Chart, Area Chart, Stacked Area Chart
- Combo Charts
- Create and Format Line and Stacked Column Chart, Line and Clustered ColumnChart
- Create and Format Ribbon Chart, Waterfall Chart, Funnel Chart
- Power BI Service
- Power BI Service Introduction, Power BI Cloud Architecture

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		• Creating Power BI Service Account, SIGN IN to Power BI Service Account • Publishing Reports to the Power BI service, Import / Getting the Report to PBI ServiceMy • Workspace / App Workspaces Tabs • DATASETS, WORKBOOKS, REPORTS, DASHBOARDS • Working with Datasets, Creating Reports in Cloud using Published Datasets
8	**Projects (Elective 1 only)**	• Facial Recognition • Social Media Analytics • Facial Detection • Data Acquisition and Productization • Object Detection • Handwriting Recognition • Sales Prediction • Stock Market Prediction • Data Security