Department of Business Administration (PG)

Value-Added Course

VACBABA22 - APPLICATION OF BUSINESS ANALYTICS USING ADVANCED EXCEL, PYTHON AND TABLEAU

Code	Title of The Paper	Hours
VACBABA22	Application Of Business Analytics Using Advanced Excel, Python And Tableau	30

Course Learning Outcomes:

1. To develop the skills necessary to do Business Analytics (Bivariate and Multivariate Techniques also real time projects along with case study).
2. To deepen the understanding of methods for collecting, analysing, and summarizing data pertinent to solving Business problems.

Unit I - Business Analytics Introduction

Business Analytics Introduction - Business Analytics Introduction- Business Analytics Brief - Data Statistics - Descriptive and Inferential - Data Visualization - Business Analytics Algorithm in Detail - Supervised Learning Algorithm - Unsupervised Learning Algorithm - Reinforcement Learning Algorithm - Business Analytics Importance and Key challenges - Life of Business Analytics Expert - Business Analytics Application.

Unit II - Data Analytics Using Advanced MS Excel – Hands-On

Descriptive Statistics using Advanced Excel:- Central Tendency - Mean - Median, Mode, Percentiles and Quartiles - Dispersion - Variance, Standard Deviation and Range - Interquartile Range - Numerical Measures -Detecting Outliers. Data Visualisation Using Excel: Graphs - Charts - create a chart and change chart type - switch row/column and chart title - legend position and data labels - column chart, line chart, pie chart and bar chart - area chart, scatter chart, trend line.

Correlation - Correlation Analysis - Formulation of Correlation Matrix - Mapping Correlation concept with Real Time Example. Regression - Linear Regression Analysis - Formulation of Regression Model - Bivariate Regression - Multiple Regressions - Conducting Multiple Regression - Mapping Bivariate Regression with Real Time Example.

Pivot Table and Pivot Chart -Inserting a PivotTable - Choosing Fields and Sort Data - Two Dimensional Pivot Table - Data Table -insert a table and sort a table - filter a table and total row. Pivot Chart - Group Pivot Table Items - Multi - level Pivot Table - Frequency Distribution - Pivot Chart and Slicers - Update Pivot Table - Calculated Field/Item - T-Test - Parametric Test - T –test (One and Two - Sample - Z - test (One and Two Sample) - F – Test (One and Two Sample).

Statistical Functions - Average function and average if function - Median, mode and standard deviation - Min function, max function, large and small function - Negative numbers to zero, random numbers and rank - Percentiles and quartiles forecast and trend. Logical Function - If function, and function and or function - nested if and roll the dice.

Lookup Function - Vlookup function and Hlookup functions - match and index and choose, text rates and offset - left lookup and two way lookup, locate maximum value and indirect - Formula Error - ##### error, #name? Error and #value! Error - #div/0! Error and #ref! Error, iferror and iserror - Circular reference and formula auditing and floating point errors.

Data Validation and Data Table - create data validation rule and input message and error alert - data validation result and rejection of invalid dates - budget limit and prevent duplicate entries - product codes and drop down list, dependent drop down list. Compatibility Function - Scenario Manager - Create Scenario using Scenario Manager - Using the Scenario Summary - Using Goal seek Analysis - Data Tables - Quadratic Equation - Using a Two Input Data Table. Data Table - insert a table and sort a table - filter a table and total row - structured references and table styles.

Solver- Load Solver Add-In - Formulate the Model - Trial and Error - Solve the Model - Transportation Problem - Assignment Problem - Shortest path problem - Maximum Flow Problem - Capital Investment - Sensitivity Analysis

Unit III - Data Visualisation Using Tableau– Hands-On

Tableau Basics: Your First Bar chart - The Business Challenge - Who Gets the Annual Bonus - Connecting Tableau to a Data File - CSV File - Navigating Tableau - Creating Calculated Fields - Adding Colors - Adding Labels and Formatting - Exporting Your Worksheet.

Time series, Aggregation, and Filters - Working with Data Extracts in Tableau - Working with Time Series - Understanding Aggregation, Granularity, and Level of Detail - Creating an Area Chart & Learning about Highlighting - Adding a Filter and Quick Filter.

Tableau - Maps, Scatterplots, and Your First Dashboard - Joining Data in Tableau - Creating a Map, Working with Hierarchies - Creating a Scatter Plot, Applying Filters to Multiple Worksheets - Let's Create our First Dashboard! - Adding an Interactive Action - Filter - Adding an Interactive Action – Highlighting.

Joining and Blending Data, PLUS: Dual Axis Charts - Understanding how LEFT, RIGHT, INNER, and OUTER Joins Work - Joins with Duplicate Values - Joining on Multiple Fields – The Showdown: Joining Data vs. Blending Data in Tableau - Data Blending in Tableau and Dual Axis Chart - Creating Calculated Fields in a Blend (Advanced Topic) - Section Recap".

Table Calculations, Advanced Dashboards, Storytelling - Downloading the Dataset and Connecting to Tableau - Mapping: how to Set Geographical Roles - Creating Table Calculations for Gender - Creating Bins and Distributions for Age - Leveraging the Power of Parameters - How to Create a Tree Map Chart - Creating a Customer

Segmentation Dashboard - Advanced Dashboard Interactivity - Analyzing the Customer Segmentation Dashboard - Creating a Storyline"

Unit IV - Data Science Using Python - Hands-on

Python Introduction - IDE and Python Packages - Python Introduction - Python IDE - Spyder, Jupiter and Notebook - Numpy Packages - Pandas Packages - Matplotlib Packages - Scipy Packages - Sklearn Packages
Python Data Types - Dictionary, List and Set and Variable Declaration - String Declaration - Tuple Declaration - Python Programming - Dictionary Declaration - List Declaration - Set Declaration - Python Data Types.

Numpy Packages - Array Handling and Manipulation - Declaration of Array - Universal Function of Numpy - Binary Functions of Numpy - Logical Functions of Numpy - Statistical Functions of Numpy.

Unit V - Data Science Using Python - Hands-on

Pandas Packages - Data frame and Loading Excel, CSV File - Pandas Packages - Accessing File Processing - Merging the Data frame - Joins - Inner, Outer, Left and Right - handling the Null values - Handling the Duplicates.

Matplotlib Packages - Line graph and Visualisation - Introduction to Matplotlib packages - Representation of Line Graph - Representation of Multi Line Graph - Including the Legends - Histogram, Scatter Diagram, Box Plot and Bar Graph Representation of Histogram - Representation of Scatter Diagram - Representation of Box Plot - Representation of Bar Graph - Area Chart, Dual Axis, Array reshaping, reverse matrix analysis Representation of Area Chart - Representation of Dual Axis.

Python - Time Series Analysis and Forecasting - Introduction to Time Series Analysis - Trend Line Analysis, Pattern Identification - Time Series Smoothening Methods - Time Series Prediction Analysis - Python - Simple Predictive Analysis - Linear Predictive Analysis - Implementation of Predictive Analysis Using Python - Multiple Predictive Model using Python - What is Multiple Predictive Model? - Building the Multiple Predictive Model using Python - Assumption of Multiple Predictive Model.
Python Correlation Analysis - What is Correlation Analysis? - Correlation Coefficient and Hypothesis Testing - Product Movement Correlation, Partial Correlation and Non Metric Correlation

Teaching Methodology

- Case Study Discussion
- Project Problem Solving
- Experiential Learning

Delivery Mode

- Blended Learning – Both Online and offline

Text Books

1. Data Analytics Using Advanced Excel by Cory Lesmeister and Dr. Sunil Kumar Chinnamgari
2. Tableau 10 Complete Reference: Transform your business with rich data visualizations and interactive dashboards with Tableau by Joshua N. Milligan (Author), Tristan Guillevin (Author)
3. Python Crash Course: A Hands-On, Project-Based Introduction to Programming by Eric Matthes

Reference Books

1. Learning Tableau 2019: Tools for Business Intelligence, data prep, and visual analytics, 3rd Edition , 2019 by Joshua N. Milligan (Author)
2. Introduction to Machine Learning with Python: A Guide for Data -2016 by Andreas C. Mueller (Author), Sarah Guido (Author)
3. Python Machine Learning Projects by Dr. Sunil Kumar Chinnamgari

E-resources

- https://analyticsindiamag.com
  https://towardsdatascience.com