

## Advanced Excel with VBA

### Module – 01 : Basic Course – Basic Formula, Functions & Charts

- Formulas and Functions
- Formula Tab
- Examples of Formulas
- Auto Sum Features
- Formula
- Charts
- Smart Art Graphics

### Module – 02 : Advanced Functions in Excel

- Introduction
- If Statements
- Nesting IF()'s
- Using Other Functions with IF's
- Concatenation
- LookUp Functions(VLOOKUP & HLOOKUP)
- Subtotals
- Hiding & Displaying Data

### Module – 03 : Data Validations

- Introduction
- Setting Data Validations
- Data Validation
- Checking for Invalid Data

### Module – 04 : Excels Analytical Tools

- Goal Seek
- Scenarios
- Summarizing Scenarios
- Creating a Scenario Pivot Table Report

### Module – 05 : Pivot Table

- Using Pivot Tables to analyze data
- Pivoting
- Pivot Table Example
- Guidelines for creating a Pivot Table in Excel
- Creating a Pivot Table

### **Module – 06 : Introduction to VBA**

- Introduction to VBA
- Work with VBA objects, properties, methods
- Working with the Visual Basic Editor
- Sub procedure, function procedure, property procedure
- Referring to Objects
- Concepts – Containers or Collections, properties, methods, events,
- Working with Workbook
- Referring to Objects
- Applying Methods
- Working with Variables and Values

### **Module – 07 : Working with Variables in Excel VBA**

- Concept of Variables
- Valid and invalid variable names
- Variables - Numeric Data Types
- Variables – Non - Numeric Data Types

### **Module – 08 : Message Box & Loop**

- Style Values and Command Buttons
- Return Values and Command Buttons
- Looping
- For...Next loop
- Do.....Loop While
- Do until.....Loop
- Do while..... Loop
- Do.....Loop until

### **Module – 09 : Array in Excel VBA**

- What is an Array?
- Declaring Arrays in Excel VBA
- One Dimensional Array
- Two Dimensional Array

### **Module – 10 : Developing Macros in Excel**

- Creating a Macro
- Excel Macro Recording facility
- Modifying the existing Macro in VB editor
- Understanding the Macro and saving a workbook with Macro contents
- Exporting files to different applications

**Module – 11 : UserForm**

- Requirement of UserForm
- Working with objects like textboxes, buttons, check boxes, spin buttons etc.
- Filling up UserForm with pre-defined values
- Macro Coding for different buttons
- Creating Connectivity between UserForm and Excel Worksheet

**Module – 12 : UserForm (Cont'd)**

- Designing UserForm with Validations
- Filling up UserForm with pre-defined values
- Creating Connectivity between UserForm and Excel Worksheet using offset
- Transfer of data from excel file to a word document
- Transfer of data from txt file to an excel document

## **Advanced Statistics**

- Types of data, Graphical representation
- Correlation, Data Modeling & Index Numbers
- Measures of Central Tendency & Dispersion
- Forecasting & Time Series Analysis
- Probability, Bayesian Theory
- Probability Distribution and Mathematical Expectation
- Sampling and Sampling Distribution
- Theory of Estimation and Testing of Hypothesis
- Analysis of Variance
- Regression Models
- Cluster Analysis
- Naïve Bayes Classification
- Time Series

## BASE SAS: SAS ESSENTIALS – Module I

### [Chapter-1](#)

#### **Introduction**

- 1.1 An Overview of the SAS System

### [Chapter-2](#)

#### **Getting Started With the SAS® System**

- 2.1 Introduction to SAS Programs
- 2.2 Running SAS Programs
- 2.3 Mastering Fundamental Concepts
- 2.4 Diagnosing and Correcting Syntax Errors
- 2.5 Exploring Your SAS Environment

### [Chapter-3](#)

#### **Getting familiar with SAS Data Sets**

- 3.1 SAS Data Libraries

### [Chapter-4](#)

#### **Producing List Report**

- 4.1 Getting Started With the PRINT Procedure
- 4.2 Sequencing and Grouping Observations
- 4.3 Identifying Observations
- 4.4 Special WHERE Statement Operators

### [Chapter-5](#)

#### **Enhancing Output**

- 5.1 Customizing Report Appearance
- 5.2 formatting Data Values
- 5.3 Creating HTML Reports

### [Chapter-6](#)

#### **Creating SAS® Data Sets**

- 6.1 Reading Raw Data Files: Column Input
- 6.2 Reading Raw Data Files: Formatted Input
- 6.3 Examining Data Errors
- 6.4 Assigning Variable Attributes
- 6.5 Changing Variable Attributes
- 6.6 Reading Excel Spreadsheets

### [Chapter-7](#)

#### **DATA Step Programming**

- 7.1 Reading SAS Data Sets and Creating Variables
- 7.2 Conditional Processing
- 7.3 Dropping and Keeping Variables
- 7.4 Reading Excel Spreadsheets Containing Date Fields

### [Chapter-8](#)

#### **Combining SAS Data Sets**

- 8.1 Concatenating SAS Data Sets
- 8.2 Merging SAS Data Sets
- 8.3 Combining SAS Data Sets : Additional Features

### [Chapter-9](#)

#### **Producing Summary Reports**

- 9.1 Introduction of Summary Reports.
- 9.2 Basic Summary Reports
- 9.3 The Report Procedure
- 9.4 The Tabulate Procedure

### [Chapter-10](#)

#### **Introduction to Graphics**

- 10.1 Producing Bar and pie Chart
- 10.2 Enhancing output
- 10.3 Producing Plots

## BASE SAS: SAS ESSENTIALS (Continued)

### SAS Programming II

#### Chapter-1

##### **Introduction**

- 1.1 Overview
- 1.2 Review of SAS basics
- 1.3 Review of DATA Step Processing
- 1.4 Review of Displaying SAS Data Sets
- 1.5 Working with Existing SAS Data Sets

#### Chapter-2

##### **Controlling Input and Output**

- 2.1 Outputting Multiple Observations
- 2.2 Writing to Multiple SAS Data Sets
- 2.3 Selecting Variables and Observations
- 2.4 Writing to an External File

#### Chapter-3

##### **Summarizing Data**

- 3.1 Creating an Accumulating Total variable
- 3.2 Accumulating Totals for a Group of Data

#### Chapter-4

##### **Reading & Writing Different Types of Data**

- 4.1 Reading Delimited Raw Data Files
- 4.2 Controlling When a Record Loads
- 4.3 Reading Hierarchical Raw data Files

#### Chapter-5

##### **Data Transformations**

- 5.1 Introduction
- 5.2 Manipulating Character values
- 5.3 Manipulating Numeric values
- 5.4 Manipulating Numeric values based on Dates
- 5.5 Converting variable Type

#### Chapter-6

##### **Debugging Techniques**

- 6.1 Using the PUT Statement
- 6.2 Using the DEBUG Option

#### Chapter-7

##### **Processing Data Iteratively**

- 7.1 Do Loop Processing
- 7.2 SAS Array Processing
- 7.3 Using SAS Arrays

#### Chapter-8

##### **Combining SAS® Data Sets**

- 8.1 Match-merging Two or more SAS Data Sets
- 8.2 Simple Joins Using the SQL Procedure

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## Advanced SAS– Module II

### Proc SQL

#### Chapter-1

##### **Introduction to the SQL Procedure**

- What is SQL?
- What is the SQL Procedure?
- Terminology
- Comparing PROC SQL with the SAS DATA step
- Note about the Example Table

#### Chapter-2

##### **Retrieving Data From a Single Table**

- Overview of the select Statement
- Selecting Columns in a Table
- Creating New Columns
- Sorting Data
- Retrieving rows that satisfy a Condition
- Summarizing Data
- Grouping Data
- Filtering Grouped Data

#### Chapter-3

##### **Retrieving Data from Multiple Tables**

- Introduction
- Selecting Data from More Than One Table by Using joins
- Using Sub queries to Select Data
- When to Use Joins and Sub queries
- Combining Queries with Set Operators

#### Chapter-4

##### **Creating and Updating Tables and Views**

- Introduction
- Creating Tables
- Inserting Rows into Tables
- Updating Data Values in a Table
- Deleting Rows

- Altering Columns
- Creating an Index
- Deleting a Table
- Using SQL Procedure Tables in SAS Software
- Creating and Using Integrity Constraints in a Table

#### Chapter-5

##### **Programming with the SQL Procedure**

- Introduction
- Using Proc SQL Options to Create and Debug Quires
- Improving Query Performance
- Accessing SAS System Information Using DICTIONRY Tables
- Using Proc SQL with the SAS Macro Facility
- Formatting PROC SQL output Using the Report Procedure
- Accessing a DBMS with SAS/ACCESS Software

#### Chapter-6

##### **Practical Problem-Solving with PROC SQL**

- Overview
- Computing a Weighted Average
- Comparing Tables
- Overlaying Missing Data Values
- Computing Percentages within Subtotals
- Counting Duplicate Rows in a Table
- Expanding Hierarchical Data in a Table
- Summarizing Data in Multiple Columns
- Creating a Summary Report
- Creating a Customized Sort Order
- Conditionally Updating a Table
- Updating a Table with Values from Another Table
- Creating and Using Macro Variables

## SAS Analytics – Module III

### **1. Introduction to Analytics & Basic Statistics**

- Types of Analytics
- Properties of Measurements
- Scales of Measurement
- Types of Data
- Measures of Central Tendency
- Measures of Dispersion
- Measures of Location
- Presentation of Data
- Skewness and Kurtosis

### **2. Introduction to Probability Theory**

- Three Approaches towards Probability
- Concept of a Random Variable
- Probability Mass Function
- Probability Density Function
- Expectation of A Random Variable
- Probability Distributions

### **3. Sampling Theory And Estimation**

- Concept of population and sample
- Techniques of Sampling
- Sampling Distributions

### **4. Theory of Estimation**

- Concept of estimation
- Different types of Estimation

### **5. Testing of hypothesis**

- Concept of hypothesis
- Null hypothesis
- Alternative hypothesis
- Type-I error
- Type-II error
- Level of Significance
- Confidence Interval
- Parametric Tests and Non Parametric Tests
- One Sample T test
- Two independent sample T test
- Paired Sample T test
- Chi square Test for Independence of Attributes.



**6. Analysis of variance**

- One Way Anova
- Two Way Anova

**7. Exploratory Factor Analysis**

- Principal Component Analysis
- Estimating the Initial Communalities
- Eigen Values and Eigen Vectors

**8. Cluster Analysis**

- Types of Clusters
- Diagrammatic Representation of clusters
- Problems of Cluster Analysis

**9. Linear Regression and Multiple Linear Regression**

- Concept of Regression and features of Linear line.
- Assumptions of Classical Linear Model
- Method of Least Squares
- Understanding the Goodness of Fit
- Test of Significance of The Estimated Parameters
- Multiple linear Regression with their Assumptions

**10. Time Series Analysis**

- Concept of Time Series and its Applications
- Assumptions of Time Series Analysis
- Components of Time Series
- Smoothing techniques

## Data Analytics Using R Programming

### Exploring R

- Installing R
- Working with Scripts
- Navigating the Workspace

### Reading Datasets into R, Exporting Data from R

- Using C() command to create Data
- Using scan() command for getting Data in R
- Reading Bigger Data files
- Getting data out of R
- Saving your work in R

### Manipulating and Processing Data in R

- Deciding most appropriate data structure
- Creating subset of data
- Adding calculated fields to data
- Combining and merging datasets in R
- Sorting and ordering Data
- Introduction to the formula interface
- Putting your data into Shape

### Using Functions and Packages in R

- Moving from Scripts to Functions
- Using Argument the smart way
- Scope of the function
- Dispatching to a Method
- Packages
- Using Packages

### Descriptive Statistics in R

- Summary Commands
- Name Commands
- Summarizing Samples
- Cumulative Statistics
- Summary Statistics for Data Frames
- Summary Statistics for Matrix Objects
- Summary Statistics for Lists
- Contingency Tables
- Cross Tabulation

### **Analyzing Data Using Functions, Loops, and Data Frames**

- Matrices, Lists, and Data Frames
- Indexing vectors, Matrices, and Lists
- Programming in R

### **Graphical Analysis in R**

- Plots for single variable
- Plots with two variables
- Plots with multiple Comparisons
- Plots with multiple Variables
- Special plots
- Saving Graphs to External Files

### **Hypotheses Testing in R**

- Introduction to Statistical Hypotheses
- Using the student's t-test
- U-test
- Paired t- and u-test
- Tests for Association
- Goodness of Fit Tests

### **Linear Regression in R**

- Basics of Linear Regression Analysis
- Working with Linear Regression
- Simple Linear Regression in R
- Linear Model result Objects

### **Tree Models**

### **Factor Analysis & Clustering**

### **Principal Component Analysis**

### **Time Series**

### **Using R Commander Package**

## Data Analytics Using Python Programming

- Python – Basics
- Build-in Data Structures & Functions
- Operating on Data in Pandas & Missing Values
- Hierarchical Indexing
- Combining Datasets – Join, Merge, append etc
- Aggregation & Grouping
- Vectorized String Operations
- Visualisation with Matplotlib
- Analysing Data Through Advanced Visualisation
- Inferential Statistics
- Designing Models with Linear Regression
- Designing Models with Logistic Regression
- Hypothesis Checking
- K-Means Clustering

## SPSS (Statistical Package for Social Science)

### Introducing to SPSS

- SPSS - Introduction
- The interface
- The variable view
- The data view
- The output view
- The syntax view

### Reading Data from various Sources

- Reading Data from a Text file
- Reading Data from a Database
- Reading Data from Excel Sheets
- Reading SPSS Data Files

### Variables & Dataset Creation

- Naming of Variable names
- Creating Labels for Variables
- Variables Type
- Binary Variables
- New data set Creation

### Data Transformations

- Transformation of Data
- Expressions creation with more than one variable
- Various Conditional Expressions

### Modifying Data Values

- Data Values Modifications
- New Variable Computation

### Crosstab Report

- Crosstab Statistics
- Creating of Crosstab Report
- Crosstab cells
- Adding various layers to crosstabs

### **Sorting and Selecting Data**

- Data Selection and Sorting
- Split-File
- Creation of Subsets of Cases

### **Working with Output**

- Working with Output
- Pivot Table Editor
- Using SPSS Results in Other Applications
- Exporting SPSS Results to Microsoft Excel, Microsoft Word and PDF Files

### **Descriptive Statistics**

- Descriptive statistics: Descriptive (univariate)
- Frequencies
- Categorical Data Measurement
- Categorical Data - Charts
- Scale Variables – Their measurements
- Recoding the existing variables

### **Univariate Analysis**

- Line Graphs
- Bar Graphs
- Pie Graph
- Graphs for cumulative frequency
- Histograms and frequency statistics – with variables
- Determining the nature of the distribution of continuous variables
- Boxplot
- T-Test and error bar

### **Multivariate Analysis**

- Bar Graph for Means
- Line graph for comparing median
- Scatters
- Correlations
- Bivariate correlations
- Partial correlations
- Plotting scatters of several variables against one other
- Execute the analyses for means comparison: t test, between-subjects ANOVA
- Perform the regression analysis (simple and multiple regression)
- Time Series