

COURSE TITLE	DATA ANALYSIS AND VISUALIZATION USING SPREADSHEETS
COURSE CODE	01AS0101
COURSE CREDITS	4

Objective:

- 1 The objective of this course is to equip students with the skills and knowledge necessary to effectively analyze and visualize data using spreadsheet software. Gain a comprehensive understanding of spreadsheet basics, including data entry, formatting, and basic functions. Apply learned skills to real-world data sets and scenarios, enabling practical, hands-on experience that can be directly applied to professional and academic tasks. Develop critical thinking skills to interpret and present data findings effectively, making informed decisions based on data analysis.

Course Outcomes: After completion of this course, student will be able to:

- 1 Understand data handling using spreadsheets
- 2 • Understand data storage management in row and column manner and will be able to understand operations over cells
- 3 Conduct data analysis using sorting, filtering, and conditional formatting to identify trends, outliers, and key insights
- 4 Design and generate a variety of charts and graphs including bar charts, line graphs, pie charts, scatter plots, and pivot charts to visually represent data
- 5 Create and use macros to automate repetitive tasks and streamline workflow processes in spreadsheets

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Fundamentals of Spreadsheets Introduction to spreadsheets, need of spreadsheets , popular spreadsheet application software, Data, Record, Table, About Spreadsheet, software for spreadsheet creation, Uses of spreadsheet, Excel software,, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage View, Formula Bar, Workbook Window, Status Bar, Task Pane, Workbook & sheets	6

Contents : Unit	Topics	Contact Hours
2	Columns & Rows Selecting Columns & Rows, Changing Column Width & Row Height, Auto fitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell – Format, value, formula, Use of paste and paste special	6
3	Functionality Using Ranges and Formulas Using Ranges, Selecting Ranges, Entering Information Into a Range, Using AutoFill, Using Formulas, Formula Functions – Sum, Average, if, Count, max, min, Upper, Lower, Using AutoSum, , Advance Formulas such as Concatenate, Vlookup, Hlookup, Match, Countif, Text, Trim	10
4	Spreadsheet Charts for Data Analysis Creating Charts, Different types of chart, Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table, Data Analysis by applying Sorting, Filter, Text to Column, Data Validation	8
5	Spreadsheet Tools Moving between Spreadsheets, electing Multiple Spreadsheets, Inserting and Deleting Spreadsheets Renaming Spreadsheets, Splitting the Screen, Freezing Panes, Copying and Pasting Data between Spreadsheets,, Hiding , Protecting worksheets	6
6	Working with PivotTables and Macros Creating PivotTables, Manipulating a PivotTable, Using the PivotTable Toolbar, Changing Data Field, Properties, Displaying a PivotChart, PivotTable Options, Adding Subtotals to PivotTables, Recording Macros, Running Macros, Deleting Macros	6
Total Hours		42

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Practical 1 Install of various spreadsheet software	2
2	Practical 2 Create spreadsheets, create various sheets and study of menus and various functional bars of spreadsheets	2
3	Practical 3 Implement various operations on rows and columns such as adjusting height and width, hiding/unhiding, insertion and deletion of rows and columns	2
4	Practical 4 Implement various cell operations such as getting cell address, cell formatting, use of paste and special paste options	2
5	Practical 5 Apply various filters on columns	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
6	Practical 6 Apply sorting on columns	2
7	Practical 7 Implement range operations: Using Ranges, Selecting Ranges, Entering Information into a Range, Using AutoFill	2
8	Practical 8 Implement Formula Functions: Sum, Average, if, Count, max, min on value range	2
9	Practical 9 Implement Formula Functions: Proper, Upper, Lower, Using AutoSum, Advance Formulas such as Concatenate	2
10	Practical 10 Implement Hlookup on table	2
11	Practical 11 Implement Vlookup on table	2
12	Practical 12 Create pivot table using pivot table toolbar and apply various operations on it	2
13	Practical 13 Create pie chart and bar chart by specifying range title and chart title	2
14	Practical 14 Create and run macro. After using it delete the macro	2
Total Hours		28

Textbook :

- 1 Mastering Advaced Excel, Rutu Arora, bpb publications, 2023
- 2 Microsoft Wxcel Formulas and Functions (Office 2021 and Microsoft 365) , Paul McFedries, Pearson, 2023
- 3 Optimizing Modeling with Spreadsheets, Kenneth R. Baker, Wiley India Pvt. Ltd., 2011
- 4 Excel Data Analysis: Modeling and Simulation , Hector Guerrero, Springer, 2010
- 5 Data Analysis with Excel , Joe Penn, Asia – Pacific Holdings Private Limited, 2020
- 6 Beginning OpenOffice Calc , Jacek Artymiak, Apress, 2011

References:

- 1 Mastering Advaced Excel , Mastering Advaced Excel , Rutu Arora, bpb publications , 2023
- 2 Microsoft Wxcel Formulas and Functions (Office 2021 and Microsoft 365) , Microsoft Wxcel Formulas and Functions (Office 2021 and Microsoft 365) , Paul McFedries , Pearson, 2023
- 3 Optimizing Modeling with Spreadsheets , Optimizing Modeling with Spreadsheets , Kenneth R. Baker , Wiley India Pvt. Ltd. , 2011

References:

- 4 Excel Data Analysis: Modeling and Simulation , Excel Data Analysis: Modeling and Simulation , Hector Guerrero , Springer, 2010
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Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
25.00	25.00	20.00	10.00	10.00	10.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the class-room.
- 3 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources:

- 1 <https://www.coursera.org/learn/business-analytics-excel>
- 2 <https://www.coursera.org/learn/excel-data-analysis>
- 3 https://infyspringboard.onwingspan.com/web/en/viewer/html/lex_auth_01350157797902745610791
- 4 https://infyspringboard.onwingspan.com/web/en/viewer/html/lex_auth_0135015608287313928737
- 5 <https://www.coursera.org/specializations/excel-data-analytics-visualization>