

**Syllabus for 4-Year UG Honours in B.Sc. (Statistics) as Major in consonance with
Curriculum framework w.e.f. AY 2026-27**

COURSE STRUCTURE (for Semester IV)

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	IV	8	Design and Analysis of Experiments	3	3
			Design and Analysis of Experiments Practical Course	2	1
		9	Applied Statistics	3	3
			Applied Statistics Practical Course	2	1
		10	Statistical data analysis using MS - excel	3	3
			Statistical data analysis using MS – excel practical course	2	1


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SEMESTER - IV

COURSE 10: STATISTICAL DATA ANALYSIS USING MS - EXCEL

Theory

Credits: 3

3 hrs/week

Course Outcomes

After completing this course, students will be able to:

1. Understand data entry and formatting, manage worksheets, apply arithmetic and logical operations, perform data sorting, filtering, validation, and use Excel add-ins for analysis.
2. Create and interpret different types of charts and graphs, prepare frequency tables, and summarize data effectively using PivotTables and Pivot Charts.
3. Calculate and interpret measures of central tendency and dispersion, apply ranking and position measures, analyze skewness and kurtosis, and generate descriptive statistics reports.
4. Analyze relationships using correlation and regression techniques, interpret regression outputs, and apply forecasting methods to predict future trends.
5. Perform hypothesis tests such as Z-test, t-test, F-test, ANOVA, and chi-square test, interpret Excel outputs, and apply results in real-world decision-making.

Unit I – Excel Basics for Data Analysis

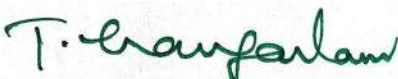
Data entry, formatting, worksheet management, Basic Excel Functions: *Arithmetic* → =SUM(), =PRODUCT(), =QUOTIENT(), =MOD(), *Logical* → =IF(), =AND(), =OR(), =IFERROR(), *Lookup* → =VLOOKUP(), =HLOOKUP(), =XLOOKUP(), =INDEX(), =MATCH(), *Cell referencing*: relative, absolute, mixed references, *Data management*: sorting, filtering, conditional formatting, *Data validation* (drop-down lists, input restrictions, error messages), *Using Excel Add-Ins*: Analysis ToolPak, Solver for advanced analysis

Unit II – Data Visualization and Frequency Analysis

Charts and Graphs: Bar, Column, Line, Pie, Area, Scatter, Histogram, Frequency tables: =COUNT(), =COUNTIF(), =COUNTIFS(), =FREQUENCY() for grouped data, PivotTables and PivotCharts for data summarization.

Unit III – Descriptive Statistics in Excel

Measures of Central Tendency: =AVERAGE(), =MEDIAN(), =MODE.SNGL(), =MODE.MULT(), =GEOMEAN(), =HARMEAN(), Measures of Dispersion: Range → =MAX()-MIN(). Variance → =VAR.S(), =VAR.P(), Standard Deviation → =STDEV.S(), =STDEV.P(), Coefficient of Variation (formula), Position & Ranking: =RANK.EQ(), =RANK.AVG(), =PERCENTRANK.INC(), =PERCENTRANK.EXC(), Shape of Distribution: Skewness → =SKEW(), Kurtosis → =KURT(), Descriptive Statistics report via Data Analysis ToolPak → Descriptive Statistics.


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Unit IV – Correlation, Regression, and Forecasting

Correlation Analysis: Pearson → =CORREL(array1,array2), Covariance → =COVARIANCE.P(), =COVARIANCE.S(), Spearman Rank Correlation using =RANK.AVG() + =CORREL(), Regression Analysis: Simple Linear Regression via Data Analysis ToolPak → Regression, Extracting slope & intercept → =SLOPE(y_range,x_range), =INTERCEPT(y_range,x_range), Regression line → =FORECAST.LINEAR(x,known_y,known_x). Trend & Forecasting:=TREND() for future predictions

Unit V – Excel for Hypothesis Testing

Hypothesis Testing: Z-Test → =Z.TEST(), t-Test → Data Analysis ToolPak → t-Test (Paired, Two-Sample Equal/Unequal Variance), F-Test → Data Analysis ToolPak → F-Test Two-Sample Variance, ANOVA → Data Analysis ToolPak → ANOVA: Single Factor / Two Factor. Goodness of Fit & Association: Chi-Square Test → =CHISQ.TEST(). Real-world case studies: business, health sciences, social sciences applications, Interpreting Excel output for decision making.

Text Books / References

1. Statistics made simple: Do it yourself on PC Approach by K.V.S. Sharma.
2. N. Balakrishnan, K. Chandrasekaran & M. Saravanavel – Practical Statistics using Microsoft Excel – Sultan Chand & Sons.
3. Covers Excel functions, descriptive statistics, correlation, regression, and hypothesis testing.
4. S. P. Gupta & Archana Gupta – Statistical Methods – Sultan Chand & Sons.
5. Widely used in Indian universities; explains descriptive statistics, correlation, regression, and tests of significance.
6. J. K. Sharma – Business Statistics: Problems and Solutions using Excel – Vikas Publishing House.
7. Good for Excel-based applications of frequency analysis, regression, and hypothesis testing.
8. P. N. Arora & S. Arora – Statistics for Management with Excel Applications – S. Chand Publishing.
9. Focused on Excel tools for descriptive statistics, regression, and data visualization.
10. Vohra, N. D. – Business Statistics – McGraw Hill Education (India).
11. Explains correlation, regression, ANOVA, and hypothesis testing with practical orientation.

Suggested Co-curricular Activities:

1. Training of students by related industrial experts
2. Assignments including technical assignments if any.
3. Seminars, Group Discussions, Quiz, Debates etc on related topics.
4. Preparation of audio and videos on tools of diagrammatic and graphical representations.
5. Collection of material/figures/photos/author photoes of related topics.
6. Invited lectures and presentations of stalwarts to those topics.
7. Visits/field trips of firms, research organizations etc.


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SEMESTER - IV

COURSE 10: STATISTICAL DATA ANALYSIS USING MS - EXCEL

Practical

Credits: 1

2 hrs/week

List of Experiments:

1. Central Tendency – Calculate mean, median, and mode for a given dataset.
2. Dispersion – Compute variance, standard deviation, and coefficient of variation.
3. Skewness and Kurtosis – Calculate skewness and kurtosis, and interpret the distribution shape.
4. Correlation Analysis – Determine simple correlation coefficient and prepare a correlation matrix for multiple variables (e.g., height, weight, age).
5. Simple Linear Regression – Fit a regression line and estimate the dependent variable.
6. Z and t-tests – Conduct one-sample and two-sample t-tests (for large and small samples).
7. Paired t-test – Compare before-and-after observations to test significance of difference.
8. F-test – Test equality of variances between two independent samples.
9. Chi-Square Test: Test the goodness of fit.
10. ANOVA – Perform one-way and two-way ANOVA to test differences among groups.

Note: MS - Excel Practical Problems must be done in Computer Lab at least 4 hours per month.


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4- Year UG Honours, Major
Syllabus
(2026-27)
Semester-IV

Model Question Paper

Time : 3hrs

Marks:75

Part-A

Answer any Five Questions. Each Question carries 3 Marks.

5x3=15

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Answer the following questions. Each question carries 12 Marks

5x12=60

11. a) Unit-I
(Or)
b) Unit-I

12. a) Unit-II
(Or)
b) Unit-II

13. a) Unit-III
(Or)
b) Unit-III

14. a) Unit-IV
(Or)
b) Unit-IV

15. a) Unit-V
(Or)
b) Unit-V