The Kelkar Education Trust's
Vinayak Ganesh Vaze College of Arts, Science & Commerce
(Autonomous)

Mithaghar Road, Mulund East, Mumbai-400081, India College
with Potential for Excellence
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Syllabus for B. Com Third Year Programme offered by
Department of Mathematics

Syllabus as per Choice Based Credit System (NEP-2020)

(June 2025 Onwards)

Board of Studies in Mathematics

V.G Vaze College of Arts, Science and Commerce (Autonomous)

Submitted by

Department of Mathematics
Vinayak Ganesh Vaze College of Arts, Science and Commerce (Autonomous)
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SEMESTER – V
MINOR PAPER
COURSE CODE: VCDA305
CREDITS: 4
(STATISTICS FOR DATA ANALYSIS-I)

Course Outcomes (COs):
After completing this course, students will be able to:

CO-1	Understand Data Types and Collection Methods: Differentiate between qualitative and quantitative data, primary and secondary sources, and various sampling techniques**.**
CO-2	Apply Descriptive Statistics: Compute and interpret mean, median, mode, variance, standard deviation, skewness, and kurtosis
CO-3	Visualize Data: Create and analyze histograms, box plots, and bar charts for business insights and apply Probability Concepts: Use probability distributions (Binomial, Poisson, Normal) for business applications.

SEMESTER-V

(MINOR PAPER)		
Title of the Course and Course Code: VGVUSMMA601	**(Statistics for Data Analysis-I)**	**No. of Credits: 04** (03L+1P)

Unit No.	**Content**	**No. of Hours**
I	**Introduction to Data Analysis and Statistics**	**10**
	Overview of statistics and data analysis, types of data: qualitative and quantitative, levels of measurement: nominal, ordinal, interval, ratio Role of statistics in decision-making and business, Introduction to data analytics tools (Excel, R, Python), Methods of Data Collection: Surveys, Experiments, and Observations, Types of Data: Primary and Secondary, Sampling Techniques: Simple random, Stratified, Systematic, Data Cleaning and Data Preparation, Descriptive vs. Inferential Statistics	
II	**Descriptive Statistics**	**10**
	Measures of Central Tendency: Mean, Median, Mode, Measures of Dispersion: Range, Variance, Standard Deviation , Skewness and Kurtosis Visualizing Data: Histograms, Box Plots, and Bar Charts ,Business Applications of Descriptive Statistics	

III	**Probability Theory and Probability Distributions**	**10**
	Basic Concepts of Probability: Random events, Sample Space, Probability rules, Types of Probability Distributions: Binomial, Poisson, Normal, Applications of Probability in Business Decision-Making.	

List of suggested practicals:

1. Introduction to Excel for data entry, Importing and handling basic data sets
2. Understanding data types and formats
3. Collecting data through online surveys (using Google Forms)
4. Creating basic frequency distributions and tables in Excel
5. Handling missing data and outliers in datasets
6. Calculation of mean, median, mode, and standard deviation in Excel
7. Drawing histograms and box plots for data visualization
8. Interpreting business-related data (e.g., sales data, customer feedback)
9. Solving probability problems using Excel functions
10. Using Excel to plot Binomial and Normal distributions
11. Conducting business simulations (e.g., demand forecasting) using random variables

Reference Books:

1."Business Statistics" by Ken Black

2."Statistics for Business and Economics" by Paul Newbold

3."Practical Business Statistics" by Andrew F. Siegel

4."Statistics for Data Science" by James D. Miller

SEMESTER – VI
MINOR PAPER
COURSE CODE: VCDA355
CREDITS: 4
(STATISTICS FOR DATA ANALYSIS-II)

Course Outcomes (COs):
After completing this course, students will be able to:

CO-1	Perform Correlation and Regression Analysis: Interpret relationships between variables using Pearson's correlation, simple and multiple regression models**.**
CO-2	Analyze Time Series Data: Identify trends, seasonality, and cyclical variations for forecasting**.**
CO-3	Conduct Hypothesis Testing: Apply T-tests, Z-tests, and Chi-square tests for decision-making in market research and business applications.

(MINOR PAPER)		
Title of the Course and Course Code: VGVUSMMA502	**(Statistics for Data Analysis-II)**	No. of Credits: 04 (03L+1P)

Unit No.	**Content**	**No. of Hours**
I	**Correlation and Regression Analysis**	**10**
	Introduction to Correlation: Pearson's correlation coefficient Interpreting correlation in business scenarios (e.g., sales and advertising spending), Simple Linear Regression: Model, Interpretation, and Prediction , Multiple Linear Regression and its applications in business	
II	**Time Series Analysis and Forecasting**	**10**
	Introduction to Time Series Data and Components: Trend, Seasonality, Cyclical variations, Methods of Forecasting: Moving Averages, Exponential Smoothing, Seasonal Adjustment, Application of Time Series in Business Forecasting (e.g., demand, sales, financial trends)	
III	**Hypothesis Testing**	**10**
	Introduction to Hypothesis Testing: Null and Alternative Hypotheses Type I and Type II Errors , T-tests, Z-tests, and Chi-Square tests , Applications in business decision-making: Market research, product testing, customer satisfaction surveys	

List of suggested Practical

1.Calculating and interpreting Pearson's correlation coefficient using Excel.

2.Performing simple linear regression analysis (e.g., sales prediction based on ad spend)

3.Plotting regression lines and making predictions.

4. Working with time series data in Excel

5.Applying moving averages and exponential smoothing techniques to forecast business trends.

6.Analyzing trends in historical sales data

7.Conducting hypothesis tests using Excel

8.Interpreting results of t-tests and chi-square tests for business scenarios

9.Analyzing customer satisfaction data through hypothesis testing

REFERENCE BOOKS:

3. **"Business Statistics"** by Ken Black

4. **"Statistics for Business and Economics"** by Paul Newbold

5. **"Practical Business Statistics"** by Andrew F. Siegel

6. **"Statistics for Data Science"** by James D. Miller