The Kelkar Education Trust's

Vinayak Ganesh Vaze College of Arts, Science & Commerce

(AUTONOMOUS)

College with Potential for Excellence

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Syllabus for Program F.Y.B.Com. Mathematics

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

(July 2023 Onwards)

Submitted by

Department of Mathematics
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❖ Semester-wise Details of Mathematics Course

Semester - I									
Teaching Scheme (Hrs/Week)				**Continuous Internal Assessment (CIA) 40 marks**			**End Semester Examination Marks**		**Total**
Course	**L**	**P**	**Credit**	**CIA-1**	**CIA-2**	**CIA-3**	**Theory**	**Practical**	
OE	03	2	4.0	15	15	10	60	100	100
CIA- II : Assignment/Project , CIA-III : APICID&A Max. Time, End Semester Exam (Theory) : 2 .00 Hrs.									

Semester - II									
Teaching Scheme (Hrs/Week)				**Continuous Internal Assessment (CIA) 40 marks**			**End Semester Examination Marks**		**Total**
Course	**L**	**P**	**Credit**	**CIA-1**	**CIA-2**	**CIA-3**	**Theory**	**Practical**	
OE	03	2	4.0	15	15	10	60	100	100
CIA-II : Assignment/Project CIA-III : APICID&A Max. Time, End Semester Exam (Theory) : 2 .00 Hrs.									

- L - Lectures
- T - Tutorials
- P - Practical
- C - Credits

SEMESTER-I			
CODE	COURSE TYPE	COURSE TITLE	CREDITS
VB129	Open Elective (OE)	BASICS STATISTICS	4=3L+1P

SEMESTER-II			
CODE	COURSE TYPE	COURSE TITLE	CREDITS
VD179	Open Elective (OE)	DATA ANALYTICS	4=3L+1P

SEMESTER-I

(OPEN ELECTIVE (OE)) (For Arts and Commerce Students)		
Title of the Course and Course Code:VB129	**BASICS STATISTICS**	**No. of Credits: 03**

Unit No.	Content	No. of Lectures
I	**Summarization Measures**	
	• Measures of Central Tendencies: Definition of Average, Types of Averages: Arithmetic Mean, Median, and Mode for grouped as well as ungrouped data. Quartiles, Deciles and Percentiles. Using Ogive locate median and Quartiles. Using Histogram locate mode. Combined and Weighted mean. **• Measures of Dispersion:** Concept and idea of dispersion. Various measures: Range, Quartile Deviation, Mean Deviation, Standard Deviation, Variance, Combined Variance.	**15**
II	**Bivariate Linear Correlation and Regression**	
	Correlation Analysis: Meaning, Types of Correlation, Determination of Correlation: Scatter diagram, Karl Pearson's method of Correlation Coefficient and Spearman's Rank Correlation Coefficient. **Regression Analysis:** Meaning, Concept of Regression equations, Slope of the Regression Line and its interpretation. Regression Coefficients, Relationship between Coefficient of Correlation and Regression Coefficients, Finding the equations of Regression lines by method of Least Squares.	**15**
III	**Time series and Index Numbers**	

	Time Series: Concepts and components of a time series. Representation of trend by Freehand Curve Method, Estimation of Trend using Moving Average Method and Least Squares Method. Estimation of Seasonal Component using Simple Arithmetic Mean for Additive Model only (For Trend free data only). Concept of Forecasting using Least Squares Method. **Index Numbers:** Concept and usage of Index numbers, Types of Index numbers, Aggregate and Relative Index Numbers, Lasperye's, Paasche's, Dorbish Bowley's, Marshall-Edgeworth and Fisher's ideal index numbers, Test of Consistency: Time Reversal Test and Factor Reversal Test. Chain Base Index Nos. Shifting of Base year. Cost of Living Index Numbers, Concept of Real Income, Concept of Wholesale Price Index Number.	**15**

Learning objective

1. The main objective of this course is to introduce statistics to undergraduate students of commerce, so that they can use them in the field of commerce and Industry to solve the real life problems.
2. To analyze the result by data handling.
3. To judge the reliability of measures of central tendency and measures of dispersions.
4. To introduce time series using moving average method and least square method.

Learning outcomes

1. Understand the operations research methodology and the problem solving approach.
2. Understand what are Mean, Median and Mode and how to calculate it.
3. Understand how all of alternative measures differ and why.
4. Calculate and interpret the correlation between two variables.
5. Determine whether the correlation is significant.
6. Calculate the simple linear regression equation for a set of data and know the basic assumptions behind regression analysis.
7. Determine whether a regression model is significant.
8. Differentiate among simple index numbers, unweighted aggregate price index numbers, weighted aggregate price index numbers, Laspeyres price index numbers, and Paasche price index numbers by defining and calculating each.

Recommended Books:

1) Mathematical & Statistical Techniques by Manan Prakashan.

2) Mathematical & Statistical Techniques,Sheth Publication, Dr.Neena Joshi, Dr.N.N.Pandey.

Reference Books

1. Operations Research by Gupta and Kapoor Operations Research by Schaum Series
2. Fundamentals of Statistics - D. N. Elhance.
3. Statistical Methods - S.G. Gupta (S. Chand & Co.
4. Statistics for Management - Lovin R. Rubin D.S. (Prentice Hall of India)
5. Statistics - Theory, Method & Applications D.S.Sancheti& V. K. Kapoor.

SEMESTER-I

(OPEN ELECTIVE (OE)) (For Arts and Commerce Students)		
Title of the Course And Course code	**BASIC STATISTICS (PRACTICAL)**	**No. of Credits: 01**
Practical/Lab work to be performed in Computer Lab. **List of practicals to be done using Excel:**		
1. Computation of Measures of Central tendency for raw data.		
2. Computation of Measures of Central tendency for discrete and continuous data.		
3. Computation of Measures of dispersion for raw data.		
4. Computation of Measures of dispersion for discrete and continuous data		
5. Graphical Presentation of data (Histogram, Frequency polygon, Ogives)		
6. Computation of Correlation coefficients		
7. Plotting of scatter diagram		
8. Computation of regression lines		
9. Measurement of trend by method of moving averages.		
10. Measurement of trend by method of least squares.		
11. Measurement of seasonal indices by the method of Ratio to trend.		
12. Computation of index numbers.		
13. Computation of real income.		
14. Computation of weighted and unweighted price index number.		
15. Computation of Lasperye's, Paasche's, Dorbish Bowley's, Marshall-Edgeworth and Fisher's ideal index numbers.		

SEMESTER-II

(OPEN ELECTIVE (OE)) **(For Arts and Commerce Students)**		
Title of the Course and Course Code:VD179	**DATA ANALYTICS**	**No. of Credits: 03**
Unit No.	**Content**	**No. of Lectures**
I	**Spread Sheet**	
	a) Creating and Navigating worksheets and adding information to worksheets • Types of data, entering different types of data such as texts, numbers, Date, functions. • Quick way to add data Auto complete, Autocorrect, Auto fill, Auto fit. Undo and Redo. • Moving data, contiguous and non-contiguous selections, Selecting with keyboard. Cut-Copy, Paste. Adding and moving columns or rows. Inserting columns and rows. • Find and replace values. Spell check. • Formatting cells, Numbers, Date, Times, Font, Colors, Borders, Fills. **b) Multiple Spreadsheets** • Adding, removing, hiding and renaming worksheets. • Add headers/Footers to a Workbook. Page breaks, preview. • Creating formulas, inserting functions, cell references, Absolute, Relative (within a worksheet, other worksheets and other workbooks). **c) Functions** • Financial functions: FV, PV, PMT, PPMT, IPMT, NPER, RATE • Mathematical and statistical functions. ROUND, ROUNDDOWN, ROUNDUP, CEILING, FLOOR, INT, MAX, MIN, MOD, SQRT, ABS, SUM, COUNT, AVERAGE **d) Data Analysis** • Sorting, Subtotal. Pivot Tables- Building Pivot Tables, Pivot Table regions, Rearranging Pivot Table.	**15**

II	**Advanced Spread Sheet**	**15**
	a) Multiple Spread sheets • Creating and using templates, Using predefined templates, Adding protection option. • Creating and Linking Multiple Spreadsheets. • Using formulas and logical operators. • Creating and using named ranges. • Creating Formulas that use reference to cells in different worksheets. **b) Functions** • Database Functions LOOKUP, VLOOKUP, HLOOKUP • Conditional Logic functions IF, Nested IF, COUNTIF, SUMIF, AVERAGEIF, String functions LEFT, RIGHT, MID, LEN, UPPER, LOWER, PROPER, TRIM, FIXED Date functions TODAY, NOW, DATE, TIME, DAY, MONTH, YEAR, WEEKDAY, DAYS360 • Statistical Functions COUNTA, COUNTBLANK, CORREL, LARGE, SMALL **c) Data Analysis** • Filter with customized condition. • The Graphical representation of data Column, Line, Pie and Bar charts. • Using Scenarios, creating and managing a scenario. • Using Goal Seek, Using Solver • Understanding Macros, Creating, Recording and Running Simple Macros. Editing a Macro (concept only)	
III	**Database and MySQL**	

	a) Introduction: Introduction to Databases, Relational and Non-relational database system MySQL as a Non-procedural Language. View of data. **b) MySQL Basics :** Statements (Schema Statements, Data statements, Transaction statements), names (table & column names), data types (Char, Varchar, Text, Mediumtext, Long text, Smallint, Bigint, Boolean, Decimal, Float, Double, Date, Date Time, Timestamp, Year, Time), Creating Database, inserting data, updating data, Deleting data, expressions, built-in-functions – lower, upper, reverse length, Ltrim, Rtrim, trim, left, right, mid, concat, now, time, date, curdate, day, month, year, dayname, monthname, abs, pow, mod, round, sqrt missing data (NULL and NOT NULL DEFAULT values) CREATE,USE, ALTER (Add, Remove, Change columns), RENAME, SHOW, DESCRIBE (CREATE TABLE, COLUMNS, STATUS and DATABASES only) and DROP (TABLE, COLUMN, DATABASES statements), PRIMARY KEY FOREIGN KEY (One and more columns) Simple Validity checking using CONSTRAINTS. **c) MySQL Simple queries:** The SELECT statement (From, Where, Group By, Having, Order	**15**
	By, Distinct, Filtering Data by using conditions. Simple and complex conditions using logical, arithmetic and relational operators (=, !,=, <, >, < >, AND, OR, NOT, LIKE) Aggregate Functions: count, sum, avg, max, min. **d) Multi-table queries:** Simple joins (INNER JOIN), SQL considerations for multi table queries (table aliases, qualified column names, all column selections self joins). **e) Nested Queries (Only up to two levels) :** Using sub queries, sub query search conditions, sub queries & joins, nested sub queries, correlated sub queries, sub queries in the HAVING clause. Simple Transaction illustrating START, COMMIT, and ROLLBACK.	

Learning objective

1. To provide basic knowledge of MS-Excel for Statistical Techniques to the students.
2. To identify spreadsheet terminology and concepts, create formulas and functions, use formatting features, and generate charts, graphs, and reports.
3. To analyse numerical data by using statistical tools and functions.
4. Be able to write SQL statements that create database objects.

Learning outcomes

1. Understand the various database structures.
2. Create database, and perform various commands related to database.
3. Plot Column, Line, Pie and Bar charts for the given data.
4. Understand how to use excel and its features.
5. After completing the practical course students are getting knowledge about the MS-Excel, Students are able to draw diagram and graphs by using MS-Excel.Write complex SQL queries to retrieve information from databases with many tables to support business decision making

Recommended Books:

1) Computer system & Applications by Manan Prakashan.

2) Computer system & Applications by Sheth Publication.

Reference books

1. "Applied Data Communications and Networks" by B Buchanan.
2. Mysql: The Complete Reference by VASWANI, McGraw Hill.
3. Computer Systems and Applications FaiyazGadiwala ,Sheth Publication.
4. Computer Systems and Applications, VerusD'sa, Marvel Publication.

SEMESTER-II

(OPEN ELECTIVE (OE)) **(For Arts and Commerce Students)**		
Title of the Course And Course code	**DATA ANALYTICS (PRACTICAL)**	**No. of Credits: 01**
Practical/Lab work to be performed in Computer Lab. **List of practicals to be done using Excel and MySql :**		
1. Perform following : i) Create Worksheet ii) Rename the worksheet iii) Hide the worksheet iv) Add and Delete the worksheet v) Cut-Copy, Paste. vi) Add data Auto complete vii) Autocorrect viii) Auto fill, Auto fit. Undo and Redo. ix) Cut-Copy, Paste. x) Save the worksheet		
2. Perform following : i) Inserting columns and rows. ii) Find and replace values iii) Check. Formatting cells, Numbers, Date, Times, Font, Colors, Borders, Fills.		

3. Creating multiple spreadsheets with Adding, removing, hiding and renaming worksheets &Add headers/Footers to a Workbook. Page breaks, preview. Creating formulas, inserting functions, cell references, Absolute, Relative (within a worksheet, other worksheets and other workbooks).
4. Computation of data using Financial functions: FV, PV, PMT, PPMT, IPMT, NPER, RATE
5. Computation of data using Mathematical and statistical functions.
6. Sorting of data, finding Subtotal of data, creating Pivot Tables.
7.Computation of data using Database Functions LOOKUP, VLOOKUP, HLOOKUP Conditional Logic functions IF, Nested IF, COUNTIF, SUMIF,AVERAGEIF,
8. Computation of data using String functions, Date functions, Statistical Functions.
9. The Graphical representation of data Column, Line, Pie and Bar charts.
10. Creating database in MySQL.
11. Build functions in MySQL.
12. Alter, delete, drop, clauses in MySQL.
13. Aggregate functions in MySQL.
14. Multitable (Join, groupby, having) queries in MySQL.
15. Nested queries in MySQL.