UG SYLLABUS

MATHEMATICS

Year	Paper	Semester	Paper Title
1	**DSC-1A**	I	Differential Equations
	DSC-1B	II	Real Analysis
2	**DSC-1C**	III	Differential & Vector Calculus
	DSC-1D	IV	Algebra
3	**DSC-1E**	V	Linear Algebra
	DSC-1F	VI	**(A)** Numerical Analysis **OR** **(B)** Integral Transforms **OR** **(C)** Analytical SolidGeometry

VAAGDEVI DEGREE AND PG COLLEGE

(Autonomous)

Kishanpura, Hanamkonda

Under Graduate Courses (Under CBCS 2025–2026 onwards)

B.Sc (Mathematics) - I Year, SEMESTER – I

Paper–I: Differential Equations

Course Code: BS 101 **Course Type:** DSC-1A

Theory: 5hours/week and Tutorials: 1hour/week

Course Objective:

The main aim of this course is to introduce the student to the techniques of solving Differential Equations and to apply their skills in solving some of the problems of Engineering and Science.

Course Outcomes:

After completing the course, the student will be able to:

CO1: Gain the complete understanding of linear differential equations of first order and first degree.

CO2: Deliberate in depth differential equations of first order and first degree.

CO3: Verify whether a given differential equation is exact or not.

CO4: Identify the appropriate integrating factors to make a non-exact differentiable equation to exact.

CO5: Apply and solve first order differential equations.

CO6: Equipped with the various tools to solve few types differential equations that arise in several branches of science.

UNIT–I

Differential Equations of First Order and First Degree: Introduction-Equations in Which Variables are Separable–Homogeneous Differential Equations – Differential Equations Reducible to Homogeneous Form–Linear Differential Equations-Differential Equations Reducible to Linear Form – Exact Differential Equations – Integrating Factors – Change in Variables (Text Book : 2.1to2.9)

UNIT–II

Equations of First Order But Not of The First Degree: Case I: Equations Solvable for p - Case II; Equations Solvable for y-Equations Solvable for x–Equations that do not Contain x*(or* y*)*-Equations Homogeneous in x and y – Equations of First Degree in x and y – Clairaut's Equation.

Applications of First Order Differential Equations: Growth and Decay–Dynamics of Tumor Growth – Radio activity and Carbon Dating – Compound Interest – Orthogonal Trajectories.

(Text Book:3.1to3.2&4.1to4.4&4.20)

UNIT – III

Higher Order Linear Differential Equations: Introduction - Solution of Homogeneous Linear Differential Equations of Order n with Constant Coefficients - Solution of the Non-Homogeneous Differential Equations with Constant Coefficients by Means of Polynomial Operators - Method of Undetermined Coefficients.(Text Book: 5.1to5.4)

UNIT–IV

Method of variation of Parameters – Linear Differential Equations with Non-Constant Coefficients – The Cauchy – Euler Equation – Legendre's Linear Equations – Miscellaneous Differential Equations.

Total Differential Equations – Simultaneous Total Differential Equations – Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$(Book:5.5 to 5.9 & 2.10 to 2.12)

TEXTBOOK:

Zafar Ahsan, Differential Equations and Their Applications(Second Edition)

REFERENCEBOOKS:

1. Frank Ayres Jr, Theory and Problems of Differential Equations.
2. Ford, L.R; Differential Equations.
3. Daniel Murray, Differential Equations.
4. S. Bala Chandra Rao, Differential Equations with Applications and Programs.
5. Stuart P Hastings, JBryce Mc Lead; Classical Methods in Ordinary Differential Equations.

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Under Graduate Courses (Under CBCS 2025–2026 onwards)

B.Sc (Mathematics) - I Year, SEMESTER – II

Paper–II: Real Analysis

Course Code: BS 201 **Course Type:** DSC-1B

Theory: 5 hours/week and Tutorials:1hour/week

Course Objectives:

The course is aimed at exposing the student to the foundations of analysis which will be useful in understanding various physical phenomena.

Course Outcomes:

After completing the course, the student will be able to:

CO1: Demonstrate a rigorous understanding of the structure of real numbers, sequences, and series.

CO2: Use theorems and convergence tests to analyze the behavior of functions and sequences.

CO3: Apply differential and integral calculus in a formal, proof-based framework.

CO4: Establish the connection between continuity, differentiability and integrability in real analysis.

CO5: Develop logical and proof-based reasoning skills fundamental to higher mathematics.

UNIT–I

Real Numbers: Field Structure and Order Structure-Bounded and Unbounded Sets-Completeness in the Set of Real Numbers- Absolute Value of a Real Number(Text Book : Chapter 1:2 to 5) Open Sets, Closed Sets and Countable Sets: Limit Points of a Set-Closed Sets-Countable and Uncountable Sets (Text Book: Chapter 2:2 to4)

Real Sequences: Sequences-Limit points of a Sequence-Convergent Sequences-Non-Convergent Sequences (Definitions)-Cauchy's General Principle of Convergence- Algebra of Sequences- Some Important Theorems-Monotonic Sequences.(Text Book : Chapter 3:1 to2&4to9)

UNIT–II

Infinite Series: Introduction-PositiveTermSeries-ComparisonTestsforPositiveTermSeries-Cauchy's Root test- D' Alembert's Ratio Test-Integral Test-Alternating Series (Leibnitz Test). (Text Book: Chapter4: 1to5, 8 &10.1)

Functions of a Single Variable (I): Limits-Continuous Functions-Functions Continuous on Closed Intervals. (Text Book: Chapter 5: 1 to 3)

UNIT–III

Functions of a Single Variable (II): The Derivative-Increasing and Decreasing Functions-Rolle's Theorem-Lagrange'sMeanValueTheorem-Cauchy'sMeanValueTheorem-Higher Order Derivatives. (Text Book: Chapter 6:1, 3 &5 to8)

UNIT–IV

The Riemann Integral: Definition and Existence of the Integral-Refinement of Partitions-Darboux's Theorem-Conditions of Integrability - Integrability of the Sum and Difference of Integrable Functions- The Integral as a Limit of Sums-Some Integrable Functions-Integration and Differentiation-The Fundamental Theorem of Calculus. (Text Book: Chapter 9:1 to 9)

TEXTBOOK:

S.C. Malik and Savita Arora, Mathematical Analysis, Fourth Edition, New Age International Publishers

REFERENCEBOOKS:

1. Kenneth A Ross, Elementary Analysis-The Theory of Calculus
2. William F. Trench, Introduction to Real Analysis
3. Lee Larson, Introduction to Real Analysis I
4. Shanti Narayan and Mittal, Mathematical Analysis
5. Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner; Elementary Real analysis

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Under Graduate Courses (Under CBCS 2025–2026 onwards)

B.Sc (Mathematics) - II Year, SEMESTER – I

Paper–III: Differential and Vector Calculus

Course Code: BS 301 **Course Type:** DSC-1C

Theory: 5hours/week and Tutorials: 1hour/week

Course Objectives:

The course is aimed at exposing the student to some basic notions in Differential Calculus.

Course Outcomes:

After completing the course, the student will be able to:

CO1: Understand and analyze functions of several variables and their derivatives.

CO2: Apply differential calculus to solve optimization and transformation problems in multiple dimensions.

CO3: Use vector differential operators (∇) to study physical quantities such as flow, force, and potential fields.

CO4: Evaluate multiple integrals and apply **fundamental integral theorems** in vector calculus to simplify and interpret results.

CO5: Build a strong foundation for advanced studies in **Mathematical Analysis, Physics, and Engineering Mathematics**.

UNIT-I

Partial Differentiation: Introduction-Functions of Two Variables-Neighborhood of a Point(a,b) - Continuity of a Function of Two Variables- Continuity at a Point - Limit of a Function of Two Variables - Partial Derivatives - Geometrical Representation of a Function of Two Variables - Homogeneous Functions. (Text Book 1: 11.1 to11.8)

UNIT-II

Theorem on Total Differentials-CompositeFunctions-DifferentiationofCompositeFunctions-Implicit Functions-Equality of $f_{xy}(a,b)$ and $f_{yx}(a,b)$, Taylor's Theorem for a Function of Two Variables- Maxima and Minima of Function of Two variables- Lagrange's Method of Undetermined Multipliers- Jacobians. (Text Book 1: 11.9to11.11 &9.6, 9.7 & 12.1)

UNIT-III

Gradient, Divergence and Curl: Introduction-Gradient-Divergence-Curl-Formulas Involving ∇- Invariance (Text Book 2: Chapter 4: 4.1to4.6)

Multiple Integrals: Double Integrals-Double Integrals in Polar Form(Book3:13.1&13.3)

Vector Integration: Introduction-Ordinary Integrals of Vector Valued Functions-Line Integrals-Surface Integrals- Volume Integrals. (Text Book 2: Chapter 5:5.1to5.5)

UNIT-IV

The Divergence Theorem, Stoke's Theorem and Related Integral Theorems: Introduction-Main Theorems- Related Integral Theorems (Text Book 2: Chapter 6: 6.1 to 6.3)

TEXTBOOK:

1. Shanti Narayan, P.K. Mittal Differential Calculus, S.CHAND,NEW DELHI, Fifteenth Edition
2. Vector Analysis, Second Edition(Schaum's Outlines), By Murray R. Spiegel, Seymour Lipschutz, Dennis Spellman.

3. Calculus and Analytical Geometry by George B.Thomas, Ross. L. Finney(Nineth Edition)

REFERENCEBOOKS:

1. William Anthony Granville, Percey F Smith and William Raymond Longley; Elements of the Differential and Integral Calculus
2. Joseph Edwards, Differential calculus for Beginners
3. Smith and Minton, Calculus
4. Elis Pine, How to Enjoy Calculus

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Under Graduate Courses (Under CBCS 2025–2026 onwards)

B.Sc (Mathematics) - II Year, SEMESTER – II

Paper–IV: Algebra

Course Code: BS 401 **Course Type:** DSC-1D

Theory: 5hours/week and Tutorials:1 hour/week

Course Objectives: The course is aimed at exposing the student to learn some basic algebraic structures like groups, rings etc.

Course Outcomes:

After completing the course, the student will be able to:

CO1: Demonstrate a solid understanding of groups, rings, and their substructures.

CO2: Construct and analyze homomorphism's and quotient structures in algebraic systems.

CO3: Apply theoretical concepts to solve problems related to group and ring structures.

CO4: Understand the logical foundation and abstraction behind modern algebra.

CO5: Develop mathematical reasoning for advanced courses such as Field Theory, Galois Theory, and Linear Algebra.

UNIT-I:

Group Theory: Definition of a Group, Some Examples of Groups – Some Preliminary Lemmas– Subgroups - A Counting Principle. (Text Book:2.1 to2.5)

UNIT-II :

Normal Sub groups and Quotient Groups–Homomorphism-Cayley's Theorem- Permutation Groups. (Text Book: 2.6, 2.7, 2.9, 2.10)

UNIT III:

Ring Theory: Definition and Examples of Rings-Some Special Classes of Rings-Homomorphism. (Text Book: 3.1 to 3.3)

UNIT IV:

Ring Theory: Ideals and Quotient Rings-More Ideals and Quotient Rings–Euclidean Rings-Polynomial Rings.(Text Book:3.4,3.5,3.7,3.9)

TEXTBOOK:

I. N. Herstein: Topics in Algebra, John Wiley & Sons(Second Edition)

REFERENCE BOOKS:

1. Bhattacharya. P.B, Jain. S.K and Nagpaul. S.R: Basic Abstract Algebra
2. Fraleigh.J.B: A First Course in Abstract Algebra.
3. Joseph A Gallian: Contemporary Abstract Algebra (9^{th}Edition).

STATISTICS SYLLABUS

YEAR	SEM	COURSE (PAPER) TITLE
FIRST	I	Basic statistics and probability
		Practical-I: Basic Statistical analysis lab
	II	Probability distributions
		Practical-II: Probability distributions lab
SECOND	III	Statistical Inference
		Practical-III: Statistical Inference lab
	IV	Analysis of Correlation, regression and experimental designs
		Practical-IV: Analysis of Correlation, regression and experimental designs lab
THIRD	V	Paper – V: Sampling Theory and Operations research
		Sampling Theory and Operations research lab
		MDC-I: Statistical Analysis
		SEC-1: Skill Enhancement Course-1

		SEC-2: Skill Enhancement Course-2
		VAC-I: Value added course-I
	VI	Paper – VI: Industrial Statistics
		Practical-IV: Industrial Statistics lab
		SEC-III Skill enhancement course-III
		SEC-IV Skill enhancement course IV
		VAC-II: Value added course-II

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B.Sc. (Statistics) I- Semester

Paper-I: BASIC STATISTICS AND PROBABILITY

(w. e. from academic year 2025-26) (CBCS)

Course Code: BS 104 Course Type: DSC-2A

Theory: 4 Hours/Week **Credits:** 4 **Marks:** 100 (Internal: 30; External: 70)

Practical: 3 Hours/Week **Credits:** 1 **Marks:** 25

Course Objective:

The objective of the paper is to understand the descriptive statistics and the application of Probability in real time problems.

Course Outcomes:

CO1: Students will be able to draw the descriptive statistics for the data and interpret the data with the appropriate graphs.

CO2: Learn how to calculate measures of central tendency and measures of dispersion.

CO3: Gain the knowledge of skewness and kurtosis.

CO4: Use basic probability rules including Additive and Multiplicative laws using the terms Independent and Mutually Exclusive events.

CO5: Translate real world problems into probability models and derive the probability density function of Transformation of random variables.

CO6: The students will be equipped with the Application of Random variables in real time problems.

CO7: Understand the concept of discrete and continuous random variables.

CO8: Get an idea of bi-variate random variable, learn how to calculate joint, marginal and Conditional, Independence of random variables.

CO9: Learn the applications of Chebyshev's and Cauchy-schwartz's in equalities.

C010: Understand the definitions of various generating functions, learn the statements of their properties with applications.

UNIT-I

Basic Statistics: Definitions, Measures, Properties and Importance of Central tendencies, Dispersions, Absolute and Relative measures of dispersions, Central and Non-central moments, Skewness and kurtosis and their inter-relationships and computations to the raw & grouped data and data sets. Usage in the domains of image analysis, pattern recognitions, Preparation of descriptive statistical analysis report based on the above descriptive statistics.

UNIT-II

Probability: Basic concepts used for defining probability, Mathematical, Statistical and Axiomatic definitions of probability, their merits and demerits. Marginal, Joint and Conditional probabilities and independence of events, Addition & Multiplicationtheorems for 'n' events, Boole's inequality and Bayes' theorem, Problems on computation of Probability and including the usage of theorems.

UNIT-III

Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass, density and distribution functions with their

properties and simple problems with illustrations. Notion of bivariate random variable, bivariate distribution, statements of its properties, Joint, marginal and conditional distributions, Independence of random variables. Transformation of one and two-dimensional random variable(s), simple problems on transformation of the random variable(s).

UNIT-IV

Mathematical Expectation: Mathematical expectation of a random variable, function of a random variable, Computation of raw and central moments, covariance using mathematical expectation with examples, Addition and multiplication theorems of expectation. Generating function, Definitions of moment generating function (MGF), cumulant generating function (CGF), probability generating function (PGF) and characteristic function (CF), their basic properties, applications and computation of those for simple probability functions, Moment inequalities: Chebychev's and Cauchy-Schwartz's inequalities and their applications.

List of Reference Books:

1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan, New Delhi.
3. William Feller: Introduction to Probability theory and its applications, (Vol-I), Wiley.
4. S.P. Gupta: Statistical Methods, S Chand, New Delhi.

VAAGDEVI DEGREE AND PG COLLEGE

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B.Sc. (Statistics) II-Semester

Paper-II: Probability Distributions

(w. e.f. academic year 2025-26)

(CBCS)

Course Code: BS 204 **Course Type:** DSC-2B

Theory: 4 Hours/Week **Credits:** 4 **Marks:** 100 (Internal: 30; External: 70)

Practical: 3 Hours/Week **Credits:** 1 **Marks:** 25

Course Objective:

The course is aimed at exposing the students to learn the various discrete and continuous Probability distributions.

Course Outcomes:

CO1: Derive various descriptive statistics and verify the existence of reproductive property of distribution using generating functions, their limitations and advantages of discrete distributions.

CO2: Distinguish between discrete and continuous distribution.

CO3: Derive various descriptive statistics and verify the existence of reproductive property of Distribution using generating functions, their limitations and advantages of continuous Distributions.

CO4: Understand the importance and application of normal distribution.

CO5: Gain the knowledge on definitions, properties and applications of chi-square, t and F-distributions.

C06: Practical Exposure to the fitting of discrete and continuous distribution by using MS-EXCEL.

UNIT-I

Discrete distributions: Discrete Uniform and Bernoulli distributions: definitions, mean, variance and simple examples. Binomial, Poisson, Negative-Binomial and Geometric distributions: Physical conditions. derivation of probability mass functions, central and moments up to fourth order, median, mode, M.G.F, C.G.F., P.G.F., C. F. nature of the curve and, reproductive property (wherever exists) special properties if any and real-life applications in various domains and probability problems related to these distributions. Poisson approximation to Binomial distribution, Poisson approximation to Negative binomial distribution.

UNIT-II

Hyper-geometric distribution: definition, real life applications, derivation of probability function, mean, variance. Binomial approximation to Hyper-geometric distribution.

Continuous distributions -I: Rectangular and Normal distributions - definition, properties such as M.G.F, C.G.F., Ch. F. and moments up to fourth order, reproductive property, wherever exists and their real-life applications. Normal distribution as a limiting case of Binomial and Poisson distributions.

UNIT-III

Continuous distributions-II: Exponential, single and two parameter Gamma distributions: Definition, Moments up to fourth order, M.G.F, C.G.F., Ch. F., reproductive property (wherever exists), nature of the curves and their real-life applications special properties (if any) and problems. Beta distribution of two kinds: Definitions, mean and variance, nature of

the curve, special properties (if any) & applications. Cauchy distribution: Definition, nature of the curve, derivation of density, Ch. f. and its special properties and its statistical significance.

UNIT-IV

Exact Sampling Distributions: Concepts of Population, Parameter, sample, Statistic, Sampling distribution and Standard error. Standard errors for various statistics. Exact sampling distributions: χ^2, t and F Definitions, curves and properties of distributions and their interrelationships. Independence of sample mean and variance in random sampling from normal distributions.

List of reference books:

1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi.
3. William Feller: Introduction to Probability theory and its applications, (Vol-I), Wiley.
4. Goon A M, Gupta M K, Das Gupta B: Fundamentals of Statistics, (Vol-I), The World Press (Pvt) Ltd., Kolkata.

VAAGDEVI DEGREE AND PG COLLEGE
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Kishanpura, Hanamkonda
B.Sc. (Statistics) III-Semester
Paper-III: STATISTICAL INFERENCE
(w. e. f. academic year 2025-26)
(CBCS)

Course Code: BS 304 **Course Type:** DSC-2C

Theory: 4 Hours/Week **Credits:** 4 **Marks:** 100 (Internal: 30; External: 70)

Practical: 2 Hours/Week **C redits:** 1 **Marks:** 25

Course Objective:

The purpose of this paper is to draw the inference to the population parameters based on sample tests.

CO1: Understand the concept of characteristics of a good estimator.

CO2: Understand difference between point estimator and interval estimation.

CO3: Understand the theory of Maximum Likelyhood estimation and the method of moments.

CO4: Students will be able to apply the confidence interval and estimate the unknown parameters of Normal Distribution by pivot method.

CO5: Application of Large sample tests and small sample tests, framing the hypothesis, level of Significance, computation of statistic, comparison between tabulated value and calculated value, decision making and statistical inference.

CO6: Understand how to compare between parametric and non-parametric tests their Advantages and disadvantages.

CO7: learn the concept of measurement scale.

CO8: Use of central limit theorem in various sample tests.

CO9: learn the various non-parametric tests of one sample and two independent samples.

CO10: Practical Exposure to the small sample test, chi-square and non-parametric tests by using MS-Excel.

UNIT –I

Point and Interval Estimation: Review on Sampling distributions; exponential family of distributions Point estimation of a parameter, concept of bias and mean square error of an estimate. Criteria of a good estimator. Consistency (Definition, necessary conditions, problems); Unbiasedness (Definition, Median modal unbiasedness necessary conditions, problems)

UNIT –II

Sufficiency: Definition, properties, Statement of Neyman's Factorization theorem, one parameter exponential family, computation of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions. Methods of Estimation: Method of Moments and Method of Maximum likelihood estimation (MLE); their properties and computation for standard probability distributions (if exists), statements of asymptotic properties of MLE. Method of least squares, Concept of interval estimation. Confidence intervals of the parameters of normal population by Pivot method**.**

UNIT –III

Testing of Hypothesis: Concepts of statistical hypotheses, Statement and Proof of Neyman-Pearson's fundamental lemma for Randomized tests. Examples in case of Binomial, Poisson, Exponential and Normal distributions and their power of the test functions.

Large sample tests: Tests for single sample mean, difference of means, single sample proportion, difference of proportions and difference of standard deviations. Order statistics: Definition, statements of their distributions and applications.

UNIT – IV

Small sample Tests: Tests for single sample mean, variance, difference of means (independent and related samples), equality of variances, Test for goodness of fit and independence of attributes.

Non-parametric tests: Advantages and disadvantages, comparison with parametric tests. Use of Central Limit Theorem for normal approximations. Single sample Sign test and Runs test, Wilcoxon-signed rank test (single and paired samples). Two independent sample tests: Median test, Wilcoxon –Mann-Whitney U test, Wald Wolfowitz's runs test**.**

List of Reference Books:

1. V.K. Kapoor and S.C. Gupta: Fundamentals of Mathematical Statistics, S. Chand & Sons,
2. Goon A.M., Gupta M.K, Das Gupta B: Outlines of Statistics, Vol-II, the World Press .
3. V.K. Rohatgi: An introduction to probability and Statistics, Wiley series.
4. Sanjay Arora and Bansal: New Mathematical Statistics, Satya Prakashan, New Delhi
5. Siegal, S. and Sidney: Non-parametric statistics for Behavioral Science. McGraw Hill.
6. Hogg, Tanis, Rao. Probability and Statistical Inference.7^{th} edition. Pearson Publication.

VAAGDEVI DEGREE AND PG COLLEGE

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B.Sc. (Statistics) IV-Semester

Paper-IV: ANALYSIS OF CORRELATION, REGRESSION AND BASIC EXPERIMENTAL DESIGNS

(w. e. f. academic year 2025-26)

(CBCS)

Course Code: BS 404 **Course Type:** DSC-2D

Theory: 4 Hours/Week **Credits:** 4 **Marks:** 100 (Internal: 30; External: 70)

Practical: 2 Hours/Week **Credits:** 1 **Marks:** 25

Course Objective:

1. The course is aimed at exposing the students to learn the various statistical methods in Distribution theory.
2. Students will be able to understand the concept of ANOVA and will be able to apply ANOVA one way and two way to real life applications.
3. Setting null and alternative hypothesis to one way and two way ANOVA, expectations

of various sum of squares and calculating missing observations are taught.

4. Designs of experiments: CRD, RBD and LSD are taught.

COURSE OUTCOMES:

CO1: Perform qualitative data analysis using theory of attributes.

CO2: Establish the linear relationship between the two variables by using scatter plots and other correlation methods.

CO3: Understand and apply the concepts of partial and multiple correlation coefficients.

CO4: Regression Analysis is performed by using least square methodology.

CO5: Practical Exposure to the curve fitting by the method of least squares, correlation and Regression lines by using MS-EXCEL.

CO6: Design the experiments through the principles, Perform ANOVA and interpret theresults.

CO7: To perform ANOVA by using CRD, RBD and LSD in MS-EXCEL.

UNIT-I

Correlation Analysis: Concept of Correlation Different Correlation Measures: Scatters diagram, Karl Pearsons coefficient (raw & grouped data), Spearman's Rank Correlation, Correlation ratio. Concepts of Partial and Multiple correlation coefficients (only for three variables). Analysis of categorical data, their independence, Association and partial association of attributes. Various measures of association: (Yule's) for two-way data and coefficient of contingency (Pearson and Tcherprow) and coefficient of colligation.

UNIT –II

Regression Analysis: Simple linear regression, Principle of least squares for estimation of Regression coefficients (linear, quadratic and power curves), properties of regression coefficients, Simple linear Regression Analysis and extending to Multiple linear Regression Analysis including Estimation of parameters and Computation of R^2, Adjusted R^2, MSE, lack of fit of the model, testing significance of regression coefficient(s). Fisher's Z-transformation for population correlation coefficient(s**)** and testing the same in case ofone sample and two samples.

UNIT –III

Analysis of Variance: Concept of Gauss-Mark off linear model with examples, statement of Cochran's theorem, Concept of Analysis of Variance (ANOVA), statistical models analysis for single factor and two factor (with one / m-observations per cell), Expectation of various sums of squares, Statistical analysis, Importance and applications of design of experiments. Concept of Critical difference, Post-hoc tests (DMR & LSD).

UNIT –IV

Design and Analysis of Experiments: Definition, Principles of experimental designs, Statistical planning for the experimentation Statistical linear models, estimation of parameters and Analysis of Completely Randomized Design (C.R.D), Randomized Block Design (R.B.D) and Latin Square Design (L.S.D). Expectation of various sum of squares. Comparison of the efficiencies of above designs. Estimation one missing observation in RBD & LSD and their analysis

List of Reference Books:

1. V.K. Kapoor and S.C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
2. V.K. Kapoor and S.C. Gupta: Applied Statistics, Sultan Chand & Sons, New Delhi
3. Sanjay Arora and Bansal: New Mathematical Statistics, Satya Prakashan, New Delhi.