



**DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE**

**(Autonomous)**

**College with Potential for Excellence, Linguistic Minority Institution**

**Affiliated to University of Madras**

**Arumbakkam, Chennai – 600 106**

**DEPARTMENT OF STATISTICS (SHIFT-II)**

**B.SC STATISTICS – PROGRAM CODE –64**

**SYLLABUS WITH EFFECT FROM 2020-21**

**CHOICE BASED CREDIT SYSTEM**

**OUTCOME BASED EDUCATION**

**PRINCIPAL**

**Dwaraka Doss Goverdhan Doss  
Vaishnav College (Shift II)  
Arumbakkam, Chennai - 600106.**

**Head of the Department**

**Head  
Department of Statistics  
Dwaraka Doss Goverdhan Doss  
Vaishnav College (Shift II)  
Arumbakkam, Chennai-600 106.**

Code& Title : 2064101/Descriptive Statistics  
Course Type : Core

Semester : I  
Credits: 4

**Course objectives:**

1. Know the uses of statistics in society
2. Organize, manage and present data
3. Analyze the statistical data graphically using frequency distribution and cumulative frequency distribution.
4. Analyze statistical data using measures of central tendency, dispersion and location.

**Course Outcomes: At the end of the Course, the Student will be able to:**

CO1	Students come to know how to collect and classify the data and its limitations
CO2	Students know how to Present/compare the data using Diagrams and Graph
CO3	Students Come to know all Descriptive values of Statistics
CO4	Students Know correlation analysis for different data and different methods
CO5	Students has to know when apply the Regression Analysis.

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	3	2	3	2	2
CO2	3	3	3	3	2
CO3	3	2	2	2	2
CO4	3	2	2	3	2
CO5	3	2	3	2	3

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	C Os
1	<b>Nature and scope of statistical methods and their limitations</b> –concepts of research design- primary and secondary sources of data - nominal, ordinal, ratio and interval scale - complete enumeration, observational studies and sample surveys.	10	C O1
2	Presentation by tables and diagrams- Construction of tables with one, two and three factors of classifications - <b>Diagrammatic representations</b> , frequency distributions for continuous and discrete data, graphical representation of a frequency distribution by histogram and frequency polygon, cumulative frequency distributions (inclusive and exclusive methods) and Ogives.	15	C O2
3	<b>Measures of location</b> , dispersion, moments and measures of skewness and kurtosis for both grouped and ungrouped data.	10	C O3
4	<b>Correlation</b> - Scatter diagram, Karlpearson's co-efficient and its properties, Spearman's rank correlation coefficient, principle of least squares and fitting of first, second degree and exponential curves,	10	C O4
5	<b>Regression Equations</b> - properties of regression equations, regression lines and concept of error in regression - partial and multiple correlation- concepts. Association of attributes and simple problems.	15	C O5

### Suggested Readings

#### Books for Study:

- 1) Richard I. Levin , David S. Rubin (2008), Statistics for Management Pearson.
- 2) Goon, AM., Gupta M.K and . Dasgupta B (1991): Fundamentals of Statistics, Vol.1, World Press, Calcutta.
- 3) M.R. Spiegel (1961): Theory and problems of statistics, Schaum's outline series
- 4) Bhat B.R, Srivenkataramana T, and Madhava K.S,(1996) Statistics: A Beginner's text Vol. I, New Age International (P) Ltd.

#### Books for Reference:

- 1) G.U.Yule and M.G. Kendall (1956): An introduction to the theory of Statistics, Charles Griffin.
- 2) Snedecor .G.W. and Cochran W.G. (1967): Statistical methods, Iowa State University Press.
- 3) Anderson, T.W. and Sclove SL. (1978): An introduction to statistical analysis of data, Houghton Mifflin co.
- 4) Croxton FE, and Cowden D.J. (1973) Applied General Statistics, Printice Hall of India.

**Course – Basic Details**

Course Code& Title : Mathematics for Statistics– I Semester: I  
Course Type : Allied Credits: 5  
Credit equivalence : NA  
Pre-requisites : NA

**Course objectives:**

1. To make understand the student about characteristic roots and vectors and reductions of quadratic and canonical forms
2. To obtain the knowledge of inverse of a matrix using Cayley Hamilton theorem and definite integrals – Reduction formula

**Course Outcomes: At the end of the Course, the Student will be able to**

CO1	Know the role of reciprocal equations in theory of equations.
CO2	Obtain the characteristic roots and vectors.
CO3	Obtain the reductions of quadratic and canonical forms.
CO4	Calculation of inverse of a matrix using Cayley Hamilton theorem.
CO5	To learned about Properties of definite integrals – Reduction formula – Bernoulli's formula

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
<b>CO1</b>	2	3	2	3	3
<b>CO2</b>	3	3	2	2	2
<b>CO3</b>	3	2	2	3	2
<b>CO4</b>	2	3	3	2	3
<b>CO5</b>	3	3	2	2	2

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	Cos
1	Matrix theory-definition and type of matrices, scalar, Elementary, Symmetric, Skew Symmetric, Hermitian, Skew - Hermitian, independent and unitary matrices- algebraic operations on matrices and their properties-elementary transformations of matrices – determinant of matrix, definition of a row rank– column rank and rank of a matrix – determination of rank of a matrix.	15	CO1
2	Inverse of a square matrix – computation of the inverse of the square matrix - solution of linear equations – Homogenous and non-homogenous systems of equations–solutions space – consistency characteristic equations– root and vectors of a square matrix – left and right eigen vectors – Cayley –Hamilton theorem.	15	CO2
3	Logarithmic differentiation, Differentiation of implicit functions, Concavity, Convexity – Points of inflexion – Euler’s Theorem - Total differential coefficients (proof not needed ) –Simple problems only.	10	CO3
4	Successive differentiation – Leibnitz theorem – Partial Differentiation – Maxima and Minima of functions of two variables.	10	CO4
5	Integration – Properties of definite integrals – Reduction formula – Bernoulli’s formula.	10	CO5

### Suggested Readings

#### Books for Study:

- 1) Narayanan and T. K. Manickavachagam Pillai (1996): Calculus (Vol I & II) S.V. Publications.
- 2) Shanti Narayanan: Differential and Integral Calculus, Chand & Co.

#### Books for Reference:

- 1) S.Narayanan and others , Calculus,S.Viswanathan publications.

NON MAJOR ELECTIVE PAPER I

Course Code & Title : FUNDAMENTALS OF ACCOUNTING Semester: I  
 Course Type : NME Credits: 2

**Course objectives:**

1. To acquire the knowledge of uses of statistics in society
2. To obtain the knowledge of organize, manage and present data

**Course Outcomes: At the end of the Course, the Student will be able to**

CO1	Know the uses of statistics in society
CO2	Organize, manage and present data

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
<b>CO1</b>	2	3	2	3	3
<b>CO2</b>	3	2	3	2	3

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	COs
1	<b>Definition of statistics-</b> limitations of statistics – data Types- complete enumeration, observational studies and sample surveys-Presentation by tables and diagrams- Measures of Locations –Measures of Dispersion – Simple Problems.	15	CO1
2	<b>Correlation-</b> Scatter diagram, Karlpearson’s co-efficient and its properties, Spearman's rank correlation coefficient, principle of least squares and fitting of first curve- Regression Equations- properties of regression equations, regression lines and concept of error in regression - partial and multiple correlation- concepts. Association of attributes and simple problems.	15	CO2

**Suggested Readings Books for Study:**

- 1) Dr.P.R.Vital (2018)-Mathematical Statistics , Margham Publications.
- SP Gupta (1976) - Statistical Methods - Sulta chand & Sons

Course – Basic Details

Course Code& Title : 2064204/Probability and Random variables

Semester : II

Course Type : Core

Credits: 4

**Course objectives:**

1. Identify random experiments in real life data and translate real-world problems into probability models.
2. Understand the use of basic probability rules, including additive and multiplicative laws, independent and mutually exclusive events.
3. Derive the probability density function of transformation of random variables
4. Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.

**Course Outcomes: At the end of the Course, the Student will be able to:**

CO1	To know the principles of Probability
CO2	To solve the simple problems based on Probability
CO3	To know the classification of Random Variables
CO4	To know the Expectation and its Properties
CO5	Find the descriptive values by using Expectation

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	2	3	2	2	2
CO2	3	3	3	3	2
CO3	3	3	2	2	2
CO4	3	2	2	3	2
CO5	3	3	3	2	3

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	COs
1	Random experiment, sample point, sample space, event, algebra of events, operations on events. Classical and relative frequency approach to probability - axiomatic approach to probability, Simple problems.	15	CO1
2	Addition theorem of probability, conditional probability, independence of events multiplication theorem –Baye's theorem and its applications.	10	CO2
3	Definition of discrete and continuous random variables - probability mass function, distribution functions and probability density functions and their properties. Expectation of random variables and its properties.	10	CO3
4	Moment generating function, characteristic function, cumulant generating function – their properties, moments, measures of locations, dispersion, Skewness and Kurtosis for discrete and continuous variants-simple problems	10	CO4
5	Bivariate distributions - discrete and continuous type, cumulative distribution function(c.d.f.), and probability mass function (p.m.f) and probability density function (p.d.f.)Marginal and Conditional expectation.	15	CO5

### **Suggested Readings:**

Books for Study:

1. A.M.Mood, F.A. Graybill and D.C. Boes (1974): Introduction to the theory of Statistics, International student ed. McGraw Hill.
2. Hogg, R.V. and Craig, A.T. (2002): Introduction to Mathematical Statistics, 4th ed. Academic Press.
3. A.M.Goon, M.K.Gupta and B. Dasgupta (1980): An outline of Statistical theory, Vol. I, 6th revised, World Press.

Books for Reference:

1. P.G.Hoel (1971): Introduction to Mathematical Statistics, Asia publishing house.
2. Murry R. Spiegel (1982): Theory and problems of Probability and Statistics, Schaum's outline series, McGraw Hill.
3. Seymour Lipshutz (1982): Theory and problems of probability, Schaum's outline series, McGraw Hill.
4. K.L.Chung (1983): Elementary probability theory with stochastic processes, Springer International student edition.
5. William.Feller (1968): An introduction to probability theory and its applications, Vol. I, 3<sup>rd</sup> ed., John Wiley & Sons.



Course Code& Title : Mathematics for statistics-II

Semester: II

Course Type : Allied

Credits: 5

**Course objectives:**

1. To make understand the student about differentiation and integration
2. To obtain the knowledge of relationship between Gamma and Beta function and Laplace transforms and inverse Laplace transforms

**Course Outcomes: At the end of the Course, the Student will be able to**

CO1	Comprehend the perception of differentiation and integration
CO2	Be familiar with the relationship between Gamma and Beta function
CO3	Be acquainted with differential equation
CO4	Understand the Laplace transform
CO5	To learned about Laplace transforms and inverse Laplace transforms

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	2	3	2	3	3
CO2	3	3	2	2	2
CO3	3	2	2	3	2
CO4	2	3	3	2	3
CO5	3	3	2	2	2

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	COs
1	<b>Sets, Operations on sets – real valued functions</b> – countability – real numbers bounds, supremum and infimum – sequence of real numbers – limit inferior and limit superior and limits of real sequences– limit theorems.	10	CO1
2	<b>Convergence and divergence of series with non-negative terms</b> – alternating series – conditional and absolute convergence – rearrangement of series – test for absolute convergence – summation by parts.	10	CO2
3	<b>Continuity and derivative – the derivative of a real function – mean value theorems</b> Taylor's theorem - concept of uniform continuity – Riemann integrals, sufficient condition for Riemann integrability, Darboux theorem, fundamental theorem of integral calculus – first mean value theorem.	15	CO3
4	<b>Improper Riemann integral</b> – Gamma and Beta integrals – multiple integrals – their evaluations using transformations of variables – simple example of multiple, integrals relevant to statistical methods.	15	CO4
5	<b>Laplace transformation (LT)</b> – definitions, LT of the function $t$ , $e^{at}$ , $\cos at$ , $\sin at$ , $e^{at} \cos bt$ , $e^{at} \sin bt$ , transform $f'(t)$ , $f''(t)$ - Inverse LT relating to the above standard functions.	10	CO5

#### -V- Suggested Readings

##### Books for Study:

1. D.Somasundram and B.Choudhary (2002): A first course in Mathematical Analysis, Narosa Publishing house.
2. Gold berg, R.R (1970): Method of Real Analysis, Oxford and IBH.

##### Books for Reference:

1. Narayanan and T. K. Manickavachagam Pillai – Ancillary Mathematics Book II
2. Bartle , R. G &Shebert, D. R. (1982): Introduction to Real Analysis, Wiley Eastern& Sons.
3. Bartle, R.G.Real 1976. Analysis, John Wiley and sons Inc.,
4. Malik, S.C. and Savita Arora (1991). Mathematical Analysis, Wiley Eastern Limited.New Delhi,
5. Sanjay Arora and Bansi (1991). Introduction to Real analysis, Satya Prakashan, New Delhi.
6. W. Rudin (1976): Principles of Mathematical Analysis, 3/e, McGraw Hill company.

Course Code & Title : BASICS OF PROBABILITY  
 Course Type : NME

Semester: II  
 Credits: 2

**Course objectives:**

1. To acquire the knowledge of real life data and translate real-world problems into probability models.
2. To understand the concept of basic probability rules, including additive and multiplicative laws

**Course Outcomes: At the end of the Course, the Student will be able to**

CO1	Identify random experiments in real life data and translate real-world problems into probability models.
CO2	Understand the use of basic probability rules, including additive and multiplicative laws, independent and mutually exclusive events.

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	3	3	2	3	3
CO2	3	2	3	2	2

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	COs
1	Definition of Probability, Axioms on Probability, Random Experiment, Sample Points and Sample Space. Event and Operations on events. Classical and relative frequency approach to probability-Axiomatic approach to probability and simple problems.	15	CO1
2	Addition theorem of Probability –Conditional Probability, Independence of events- Multiplication theorem-Baye’s Theorem (without Proof) Simple problems- Discrete and Continuous Random Variable - simple problems (Related to Discrete Random Variable Problems only)	15	CO2

**REFERENCE BOOKS:**

1. P.R.Vital : Mathematical Statistics, Margham Publications.
2. K.L. Chung (1983) : Elementary Probanbility theory with stochastic processes, Springer International student edition.

Course – Basic Details

Course Code & Title : 2064308/Distribution Theory

Semester: III

Course Type: Core

Credits: 4

**Course objectives:**

1. Understand the basic concept of Probability distribution and density function
2. Identify the characteristics of different discrete and continuous distributions.
3. Identify the type of statistical situation to which different distributions can be applied.
4. Comprehend the Sampling distributions.
5. Be acquainted with concept of Limiting distributions.

**Course Outcomes: At the end of the Course, the Student will be able to:**

CO1	To know the problem of discrete distributions.
CO2	To solve the continuous distributions
CO3	To know the classification of Random Variables
CO4	To know the bivariate normal distribution
CO5	To solve the problem of CLT and convergence in probability and distributions

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
<b>CO1</b>	3	2	2	2	2
<b>CO2</b>	2	3	3	3	2
<b>CO3</b>	3	2	2	2	2
<b>CO4</b>	3	3	2	2	2
<b>CO5</b>	2	3	3	2	3

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	C Os
1	Discrete distributions: Binomial, Trinomial and Multinomial distributions and their properties - Poisson, Negative Binomial and Geometric distributions –interrelationships and their properties.	15	C O1
2	Continuous distributions: Normal, Uniform, Exponential, Gamma and Beta distributions and their properties.	10	C O2
3	Bivariate Normal Distribution and its properties-marginal and conditional distributions-simple problems.	10	C O3
4	Central Limit Theorem- Lindeberg- Levy, Demovier's (statement only) - convergence in probability, convergence in distribution, convergence in mean square- simple problems.	15	C O4
5	Order statistics-distribution of first, $n^{\text{th}}$ and $i^{\text{th}}$ order statistics, joint distribution of $r^{\text{th}}$ and $s^{\text{th}}$ order statistics-distribution of median and range- Simple problems.	10	C O5

### Suggested Readings

#### Books for Study :

1. Parimal Mukhopadhyay,(1996), Mathematical Statistics, New Central Book Agency
2. Goon, AM., Gupta M.K and .Dasgupta B (1991): Fundamentals of Statistics, Vol.1, World Press, Calcutta

#### Books for Reference:

1. Hogg, R. V and Craig, A. T (2002), Introduction to Mathematical Statistics, Pearson Education Asia, India.
2. A.M.Mood, F.A. Graybill and D.C. Boes (1974): Introduction to the theory of Statistics, International student ed. McGraw Hill.

**Course – Basic Details**

Course Code & Title : C- Programming Language Semester : III  
Course Type : Allied Credits : 4

**Course objectives:**

1. To impart the knowledge of big data using c programming and mean and variance using C program
2. To obtain the knowledge of Pointer expressions and Learn the statements of C language.

**Course Outcomes: At the end of the Course, the Student will be able to**

CO1	Analyze the big data using c programming.
CO2	Compute the mean and variance using C program and Create and update sequential and random file.
CO3	Understand the Pointer expressions and Learn the statements of C language
CO4	Understand the importance of functions
CO5	Creation of file processing

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	2	2	2
CO3	3	2	2	3	2
CO4	3	3	3	2	3
CO5	3	3	2	2	2

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	COs
1	Introduction to “C”, variables, data types - declarations, type conversions, increment and decrement, Bitwise, Logical and Assignment operators.	10	CO1
2	Expression and conditional expressions, control structures, IF-ELSE, SWITCH, WHILE, FOR and DO WHILE loop structures. Break continue, GO and Lable statements. Function, function returning, Non-integers, Function arguments-Static and register variables..	15	CO2
3	Arrays and Strings-Array Declaration, Multidimensional Arrays Strings/ Character Arrays, Array initialization-Pointers and addresses. Pointers and Arrays Pointer to function.	15	CO3
4	Standard input and output -formatted output-output-Access to the standard library.	10	CO4
5	File Access, File handling in C-File descriptions - Error handling - Low level i/o- Read and Write". Open, Create, Close, Unlike.	10	CO5

### Suggested Readings

#### Books For Study:

1. Balagurusamy,E.(1997):ANSI,C“Programming,Tata-McGrawHillPublishers Ltd.
2. B.W.Kernighan,D.M.Ritchie C programming Language 2<sup>nd</sup> Edition,

#### Books for Reference:

1. Yaswant Kanetkar (1997): Let Us „C“,BPB Publications, New Delhi.
2. Bruce,H.Hunter: Introduction to „C“. K.N. King, C Programming – A Modern Approach.

Course – Basic Details

Course Code & Title : 2064410/ Statistical Inference- I

Semester: IV

Course Type : Core

Credits: 5

**Course objectives:**

1. To know the concepts of Sampling distributions, Point Estimation and Unbiasedness.
2. To analysis the concepts of Testing of Hypothesis and Test of Significance.

**Course Outcomes: At the end of the Course, the Student will be able to:**

CO1	To know the Sampling distribution
CO2	To solve the Consistency and Efficiency of an estimator
CO3	To know the MVUE, BLUE, Rao - Blackwell theorem-Sufficiency
CO4	To know the Testing of Hypothesis
CO5	To solve the problems based on power of a test - Most powerful test – Neyman-Pearson lemma

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	2	3	2	3	2
CO2	3	3	2	3	2
CO3	3	2	2	3	3
CO4	2	3	2	2	2
CO5	2	3	3	2	3

**3-Strong 2-Medium 1-Low**



Sl No.	Contents of Module	Hrs	COs
1	Sampling distributions - concept - distributions of mean and variance from Normal population. Sampling distributions : Chi-square, Student's t and F distributions - Derivation of their density functions and their properties	10	CO1
2	Point Estimation - Problem of Point estimation - Properties of estimators- Consistency and Efficiency of an estimator. Sufficiency of a statistic - Neyman-Fisher factorization theorem (discrete case) - Simple problems.	15	CO2
3	Unbiasedness - Properties, MVUE, BLUE, Rao - Blackwell theorem-Sufficiency and completeness, Lehman- Scheffe theorem, Cramer- Rao inequality - simple problems.	10	CO3
4	Testing of Hypothesis - Neyman - Pearson theory - Statistical Hypothesis - Simple and composite hypothesis, Null and Alternative Hypothesis - Two types of errors – critical region- power of a test - Most powerful test – Neyman-Pearson lemma –p-value and its interpretation, simple problems.	15	CO4
5	Test of Significance - Interval Estimation - Confidence Interval for proportions, mean(s), variance, and variance ratio based on chi square, student's t, F and Normal distributions.	10	CO5

### Suggested Readings

#### Books for Study:

1. Mood, AM. Graybill , F.A. and Boes, D.C. (1974) : Introduction to the theory of Statistics, McGraw Hill.
2. Hogg R.V. and Craig, A.T. (2002): Introduction to mathematical statistics, 3rd edition, Academic Press, USA.
3. Goon, A.M. Gupta, M.K., and Das Gupta, B. (1980): An outline of statistical theory, Vol.I, 6th revised ed. World Press limited, Calcutta.

#### Books For Reference:

1. Hoel, P.G. (1971) : Introduction to mathematical Statistics, Asia publishing house.
2. Rohatgi, V.K. (1984) An introduction to probability theory and mathematical statistics, Wiley Eastern.
3. Degroot, M.H. (1975): Probability and Statistics, Addison - Wesley
4. Spiegel, M.R. (1982): Theory and problems of probability and statistics, Schaum's outline series, McGraw Hill
5. Snedecor, G.W. and Cochran, W.G. (1967): Statistical methods 6th edition, Oxford IBH

**Course – Basic Details**

Course Code & Title : Numerical Methods Semester: IV  
Course Type : Allied Credits: 4  
Credit equivalence : NA  
Pre-requisites : NA

**Course objectives:**

1. To impart the knowledge of finite difference, interpolations and Numerical differentiation.
2. To obtain the knowledge of Numerical integration.

**Course Outcomes: At the end of the Course, the Student will be able to**

CO1	Understand the concept of finite difference
CO2	Learn about interpolations
CO3	To know the concept of Numerical differentiation and Integrations
CO4	Understand the importance of Numerical differentiation upto 2 <sup>nd</sup> order only-simple problems.
CO5	Understand the concept of Numerical integration

**Mapping of Course Outcomes to Program Specific Outcomes:**

	PSO1	PSO2	PSO3	PSO4	PSO 5
<b>CO1</b>	2	3	2	3	3
<b>CO2</b>	3	2	2	2	2
<b>CO3</b>	3	2	2	3	2
<b>CO4</b>	2	3	3	2	3
<b>CO5</b>	3	3	2	3	2

**3-Strong 2-Medium 1-Low**

Sl No.	Contents of Module	Hrs	COs
1	Finite differences-forward and backward differences, operators E and $\Delta$ , and their basic properties, Interpolation with equal intervals: Newton's forward and backward differences-simple problems.	15	CO1
2	Interpolation with unequal intervals: Divided differences and their properties, Newton's divided differences formula and Lagrange's formula for interpolation – simple problems.	10	CO2
3	Central difference interpolation formula-gauss forward and backward differences formulae - Stirling, Bessel's Everett's central difference formula.	10	CO3
4	Inverse interpolation -Lagrange's method - iteration of successive approximation method - simple problems. Numerical differentiation - Numerical differentiation upto 2 <sup>nd</sup> order only-simpleproblems.	10	CO4
5	Numerical intergration -Trapezoidal rule - simpsons 1/3rd and 3/8th rules-Weddle's rule-Euler's summation formula. Numerical method of solution of ordinary differential equations -Taylor's series method - Euler method and Runga Kutta upto second order – simple problems.	15	CO5

### Suggested Readings

#### Books for Study :

1. B.D. Gupta , Numerical Analysis, Konark Publishing.
2. Saxena, Calculus of finite differences and Numerical Analysis S. Chand & Co.

#### Books for Reference:

1. Gupta-Malik, Krishna Prakastan Mandir, Calculus of finite differences and Numerical analysis, Meerut.
2. M.K. Venkataraman, Numerical methods in Science and Engineering, National publishing house, Chennai.
3. M.M. Ramasamy and Palaniappan, Numerical mathematics





## Course – Basic Details







