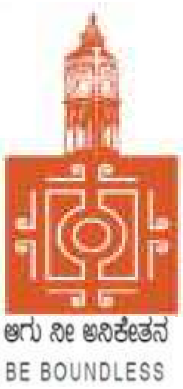

BENGALURU CITY UNIVERSITY

CHOICE BASED CREDIT SYSTEM

(Semester Scheme with Multiple Entry and Exit Options for Under Graduate Course)

Syllabus for B.Sc. Mathematics
(V & VI Semester)

2023-24 onwards

PROCEEDINGS OF THE BOS MEETING IN MATHEMATICS FOR UG CONDUCTED ON 11 SEPTEMBER 2023 IN THE DEPARTMENT OF MATHEMATICS, BENGALURU CITY UNIVERSITY, CENTRAL COLLEGE CAMPUS, ENGALURU

The following members attended the BOS meeting to finalize the syllabus of mathematics papers of BSc Fifth and Sixth semesters under NEP 2020 scheme and constitute the Board of Examiners for BSc Mathematics for the academic year 2023-24

1. Dr Ramesh B Kudenatti	Chairman	
2. Dr. M. S Nagashree	Member	
3. Prof V. S Ramesh Babu	Member	
4. Dr. Bhagya S	Member	
5. Prof Nagarathna V R	Member	
6. Prof Shobha T	Member	
7. Prof Ravindranath	Member	
8. Prof Poornima S	Member	

The following members were absent:

9. Prof. T Gangadharaiah	Member
10. Prof Sanjaykumar Pattankar	Member
11. Prof Chitty Babu	Member

The esteemed members discussed in deep the contents of the syllabi of mathematics and finalized syllabi of both semesters and also BOE for UG for the academic year 2023-2024.

The Chairman thanked all the members for their cooperation.

Ramesh B Kudenatti
Chairman, BOS (UG)

Chairman
Department of Mathematics
Bengaluru City University
Central College Campus
Bengaluru - 560 001

Board of Studies in Mathematics for UG

(No. BCU/BoS/Mathematics (UG)/147/2023-24 dated: 31-08-2023)

1.	Dr Ramesh B Kudenatti	Chairman
2.	Dr.M S Nagshree	Member
3.	Prof. V S Ramesh Babu	Member
4.	Dr. Bhagya S	Member
5.	Prof Nagarathna	Member
6.	Prof Chitty Babu	Member
7.	Prof Shobha T	Member
8.	Prof Ravindranath	Member
9.	Prof Poornima S	Member

Name of the Degree Program ***: B.A./B.Sc.***
Discipline Course ***: Mathematics***
Starting Year of Implementation ***: 2021-22 (I & II Semesters)***
2022-23 (III & IV Semesters)2023-24 (V & VI Semesters)

Programme Outcomes (PO): By the end of the program the students will be able to :

PO 1	**Disciplinary Knowledge:** Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, Geometry, differential equations and several other branches of pure and applied mathematics. This also leads to study the related areas such as computer science and other allied subjects
PO 2	**Communication Skills**: Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. The skills and knowledge gained in this program will lead to the proficiency in analytical reasoning which can be used for modeling and solving of real life problems.
PO 3	**Critical thinking and analytical reasoning:** The students undergoing this programme acquire ability of critical thinking and logical reasoning and capability of recognizing and distinguishing the various aspects of real life problems.
PO 4	**Problem Solving** : The Mathematical knowledge gained by the students through this programme develop an ability to analyze the problems, identify and define appropriate computing requirements for its solutions. This programme enhances students overall development and also equip them with mathematical modelling ability, problem solving skills.
PO 5	**Research related skills:** The completing this programme develop the apability of inquiring about appropriate questions relating to the Mathematical concepts in different areas of Mathematics.
PO 6	**Information/digital Literacy**: The completion of this programme will enable the learner to use appropriate software's to solve system of algebraic equation and differential equations.
PO 7	**Self – directed learning**: The student completing this program will develop an ability of working independently and to make an in-depth study of variousnotions of Mathematics.
PO 8	**Moral and ethical awareness/reasoning:** : The student completing this program will develop an ability to identify unethical behavior such as fabrication, falsification or misinterpretation of data and adopting objectives, unbiased and truthful actions in all aspects of life in general and Mathematical studies in particular.
PO 9	**Lifelong learning**: This programme provides self-directed learning and lifelong learning skills. This programme helps the learner to think independently and develop algorithms and computational skills for solving realword problems.
PO 10	Ability to peruse advanced studies and research in pure and applied Mathematical sciences.

Assessment

Weightage for the Assessments (in percentage)

Type of Course	**Formative Assessment/I.A.**	**Summative Assessment (S.A.)**
Theory	40%	60 %
Practical	50%	50 %
Projects	40 %	60 %
Experiential Learning (Internship etc.)	--	--

Courses for B.A./B.Sc. with Mathematics as Major Subject

B.A./B.Sc. Mathematics

(V and VI Semester)

Semester	Course No.	Theory/ Practical	Credits	Paper Title	Marks in percentage	
					S.A.	I.A.
V	MATDSCT5.1	Theory	4	Real Analysis-II and Complex Analysis	60	40
	MATDSCP5.1	Practical	2	Theory based Practical's on Real Analysis-II and Complex Analysis	25	25
	MATDSCT5.2	Theory	4	Vector calculus and Analytical Geometry	60	40
	MATDSCP5.2	Practical	2	Theory based Practical's on Vector calculus and Analytical geometry	25	25
VI	MATDSCT6.1	Theory	4	Linear Algebra and Calculus of Variation	60	40
	MATDSCP6.1	Practical	2	Theory based Practical's on Linear Algebra and Calculus of Variation	25	25
	MATDSCT6.2	Theory	4	Numerical Analysis	60	40
	MATDSCP6.2	Practical	2	Theory based Practical's on Numerical Analysis	25	25

Syllabus for B.A./B.Sc. with Mathematics as Major Subject &

B.A./B.Sc. Mathematics

SEMESTER – V

MATDSCT 5.1: Real Analysis-II and Complex Analysis	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 56 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes:

The overall expectation from this course is that the student builds a basic understanding on improper integrals and complex analysis. The broader course outcomes are listed as follows. At the end of this course, the student will be able to:

1. Carry out certain computations such as improper integrals involving Beta and Gamma functions.
2. Exhibit certain properties of mathematical objects such as integrable functions, analytic functions, harmonic functions and so on.
3. Prove some statements related to complex integral as well as in complex analysis
4. Carry out the existing algorithms to construct mathematical structures such as analytic functions.
5. Evaluate the utility of complex analysis in solving real world problems.

Real Analysis-II

Unit – I: Improper Integrals

Improper integrals of first, second and third kinds with examples. Improper integral has the limit of proper integral.

Beta-Gamma functions: Definitions, Properties and examples, relations between beta and gamma functions, standard theorems, applications of evaluations of definite integrals, duplication formula and applications. **14 Hours**

Complex Analysis

Unit – II: Complex numbers and functions of complex variables

Complex numbers-Cartesian and polar form-geometrical representation-complex-Plane- Euler's formula- $e^{i\theta} = \cos\theta + i\sin\theta$. Functions of a complex variable-limit, continuity and differentiability of a complex function. Analytic function, Cauchy-Riemann equations in Cartesian and Polar forms-Sufficiency conditions for analyticity Cartesian form only)- Harmonic function-standard properties of analytic functions-construction of analytic function when real or imaginary part is given-Milne Thomson method. **14 Hours**

Unit-III: Complex Integration

Definition, Line integral, properties and problems. Cauchy's Integral theorem-proof using Green's theorem-direct consequences. Cauchy's Integral formula with proof and various types of singularities, Cauchy's generalized formula for the derivatives with proof and applications for evaluation of simple line integrals. Cauchy's inequality with proof, Liouville's theorem with proof, fundamental theorem of algebra with proof. **14 Hours**

Unit –IV: Complex Transformations

Transformations: Definition- Jacobian of a transformation- Identity transformation- Reflection- Translation- Rotation- Stretching- Inversion- Linear transformation- Definitions- Bilinear transformations- Cross-ratio of four points- Cross-ratio preserving property-

Preservation of the family of straight lines and circles- Conformal mappings- Discussion of the transformations $w = z^2, w = \sin z, w = \cos z,\ w = \cosh z, w = \sinh z\ , w = e^z$, and $w = \frac{1}{2}\left(z + \frac{1}{z} \right)$

14 Hours

References

1. GE Andrews, R Askey, R Roy, Special Functions, CUP, Cambridge
2. BS Grewal. Higher Engineering Mathematics, Khanna Publications, New Delhi
3. SC Malik, Real Analysis, New Age Internationals (India), I edition, 1982.
4. NP Bali, Real Analysis Golden Series, 2013.S
5. LV Ahlfors, Complex Analysis, 3rd Edition, McGraw Hill Education
6. BP Palka, Introduction to the Theory of Function of a Complex Variable, Springer
7. Serge Lang, Complex Analysis, Springer
8. S. Shanthinarayan, Theory of Functions of a Complex Variable, S. Chand Publishers.
9. S. Ponnuswamy, Foundations of Complex Analysis, 2nd Edition, Alpha Science international Limited.
10. RV Churchil & J.W. Brown, Complex Variables and Applications, 5th ed, McGraw Hill Companies.

MATDSCP 5.1: Practical's on Real Analysis-II and Complex Analysis	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 56 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problem on Real Analysis and Complex Analysis studied in **MATDSCT 5.1 by** using FOSS software's.
3. Acquire knowledge of applications of Real Analysis and Complex Analysis through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS) Suggested Software's: Maxima/Scilab /Python/R.

Suggested Programs:

1. Evaluation of the integrals using Gamma functions
2. Evaluation of the integrals using Beta functions
3. Evaluation of the integrals involving duplication formula
4. Program on verification of Cauchy – Riemann equations (Cartesian form) or test for analyticity.
5. Program on verification of Cauchy – Riemann equations (Polar form) or test for analyticity.
6. Program to check whether a function is harmonic or not.
7. Program to construct analytic functions through Milne–Thompson method.
8. Illustrating orthogonality of the surfaces obtained from the real and imaginary parts of an analytical function.
9. Verification of problems on Cauchy's integral theorem.
10. Verification of problems on Cauchy's integral formula.
11. Program to find cross ratio of points and related aspects.
12. Program to find fixed points of bilinear transformations.

MATDSCT5.2: Vector Calculus and Analytical Geometry	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 56 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes: This course will enable the students to

1. Get introduced to the fundamentals of vector differential and integral calculus.
2. Get familiar with the various differential operators and their properties.
3. Get acquainted with the various techniques of vector integration.
4. Learn the applications of vector calculus.
5. Recollect the fundamentals of Analytical Geometry in 3D.
6. Interpret the geometrical aspects of planes and lines in 3D.

Vector Calculus

Unit – I: Geometry of space curves

Vector function of a scalar variable – interpretation as a space curve, derivative, tangent, normal and binormal vectors to a space curve; Curvature and Torsion of a space curve- definitions, derivation and problems, Serret- Frenet formulae.
Orthogonal curvilinear coordinates- relations between base vectors and normal vectors, reciprocity of these vectors, arc, area and volume element, specialization of Cartesian, cylindrical and spherical coordinates. **14 Hours**

Unit – II: Vector differential calculus

Scalar field - Gradient of a scalar field, geometrical meaning, directional derivative, unit normal using surfaces - tangent plane and normal to the surface;
Vector field - divergenceand curl of a vector field, geometrical meaning, solenoidal and irrotational fields; Laplacian of a scalar field; Vector identities. **14 Hours**

Unit- III: Vector Integration

Definition of line integral and properties with examples. Double integrals- conversion to iterated integrals, evaluation of double integral by change of order and variables. Computation of plane and surface areas, volume underneath a surface. Triple integrals and evaluation- change of variables, volume as a triple integral. Green's theorem in the plane (without proof) –related problems, Direct consequences of the theorem; Gauss' Divergence theorem (without proof) –related problems, Stokes' theorem (without proof) –related problems. **14 Hours**

Analytical Geometry

Unit-IV: **Planes, Straight Lines and Spheres**.

Planes: Distance of a point from a plane, Angle between two planes, pair of planes, Bisectors of angles between two planes.
Straight lines: Equations of straight lines, Distance of a point from a straight line, Distance between two straight lines, Distance between a straight line and a plane.
Spheres: Different forms, Intersection of two spheres, Orthogonal intersection, Tangents and normal.
14 Hours

References:

1. Robert J. T. Bell (1994). An Elementary Treatise on Coordinate Geometry of Three Dimensions. Macmillan India Ltd.
2. D. Chatterjee (2009). Analytical Geometry: Two and Three Dimensions. Narosa Publishing House.

3. Shanthi Narayan and P. K. Mittal, *Analytical Solid Geometry*, S. Chand Publications.
4. A. N. Das, *Analytical Geometry of Two and Three Dimensions*, New Central Book Agency Pvt. Ltd.
5. M. D. Raisinghania, *Vector Calculus*, S Chand Co. Pvt. Ltd., 2013.
6. M. Spiegel, *Vector Analysis*, second Edition, Schaum's Outline Series, Mc-Graw Hill,Education, 2017.
7. C. E. Weatherburn, *Elementary Vector Analysis*, Alpha edition, 2019.
8. P. N. Wartikar and J. N. Wartikar, *A Textbook of Applied Mathematics*, Vol. II, Pune Vidyarthi Griha Prakashan, Pune, 2009.
9. C. E. Weatherburn, *Differential Geometry of Three Dimension*, Khosla Publishing House, 2020.
10. B. S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers.
11. G. B. Thomas and R. L. Finney, *Introduction to Calculus and Analytical Geometry*, Narosa Publishing House, 2010.

MATDSCP5.2: Practical's on Vector Calculus and Analytical Geometry	
Teaching Hours : 4 Hours/Week	**Credits: 2**
Total Teaching Hours: 56 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problems related to Analytical Geometry and Vector Calculus using FOSS software.

Practical/Lab Work to be performed in Computer Lab (FOSS) Suggested Software: Maxima/Scilab /Python/R.

Suggested Programs:

1. Program on vector differentiation and finding unit tangent.
2. Program to find curvature and torsion of a space curve.
3. Program to find the gradient and Laplacian of a function.
4. Program to find the divergence and curl of a vector function.
5. Program to evaluate line integral with constant and variable limits.
6. Program to evaluate a double integral with constant and variable limits.
7. Program to evaluate a triple integral with constant and variable limits.
8. Program to evaluate Green's theorem.
9. Program to evaluate Gauss-divergence theorem.
10. Program to evaluate Stokes' theorem.
11. Program to find equation and plot sphere.
12. Program to find distance between a straight line and a plane.

SEMESTER – VI

MATDSCT 6.1: Linear Algebra and Calculus of Variations	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 56 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes:

The overall expectation from this course is that the student will build a basic understanding in few areas of linear algebra such as vector spaces, linear transformations and eigenvalue analysis. Some broader course outcomes are listed as follows. At the end of this course, the student will be able to

1. Identify and analyze the algebraic structures such as ring, field, and integral domain.
2. Understand the concepts of vector spaces, subspaces, bases dimension and their properties.
3. Understand the concept of linear transformation and eigenvalue analysis.
4. Understand the concept of functionals and applications.
5. Apply the knowledge gained to various situations inside and outside mathematics.

Unit I: Rings, Integral Domains, Fields

Rings – definition and properties of rings, Rings of integers modulo n, Subrings, Ideals - Principal, Prime and Maximal ideals in a commutative ring - examples and standard properties following the definition, Homomorphism, Isomorphism – properties, Quotient rings, Integral Domain, Fields – properties following the definition, Fundamental Theorem of Homomorphism of Rings, Every field is an integral domain, Every finite integral domain is a field with examples. **14 Hours**

Unit – II: Vector Spaces

Vector spaces - Definition, examples and properties; Subspaces - Examples, criterion for a sub-set to be a subspace and some properties; Linear Combination - Linear span, Linear dependence and Linear independence, basic properties of linear dependence and independence, techniques of determining linear dependence and independence in various vector spaces and related problems; Basis and dimension - Co-ordinates, ordered basis, some basic properties of basis and dimension and subspace spanned by given set of vectors; Quotient space. Dimension of quotient space (derivation in finite case); Sum and Direct sum of subspaces - Dimensions of sum and direct sum spaces (Derivation in finite case). **14 Hours**

Unit – III: Linear Transformations

Linear transformation - Definition, examples, equivalent criteria, some basic properties and matrix representation and change of basis and effect on associated matrix, similar matrices; Rank - Nullity theorem - Null space, Range space, proof of rank nullity theorem and related problems. Eigenvalues and eigenvectors of linear transformations.

14 Hours

Unit-IV: Calculus of Variations

Variation of a function f=f(x,y,y')-variation of corresponding functional, extremal of a functional, variational problem, Euler's equation and particular forms, examples, standard problems like geodesics, minimal surface of revolution, hanging chain problem, Brachistochrone problem, isoperimetric problem. **14 Hours**

References:

1. I. N. Herstein, *Topics in Algebra*, 2nd Edition, Wiley.
2. Stephen H. Friedberg, Arnold J. Insel & Lawrence E. Spence (2003), Linear Algebra (4^{th} Edition), Printice-Hall of India Pvt. Ltd.
3. F. M. Stewart, *Introduction to Linear Algebra*, Dover Publications.
4. S. Kumaresan, *Linear Algebra*, Prentice Hall India Learning Private Limited.
5. Kenneth Hoffman & Ray Kunze (2015), Linear Algebra, (2^{nd} Edition), Prentice Hall India Leaning Private Limited.
6. Gilbert. Strang (2015), Linear Algebra and its applications, (2^{nd} Edition), Elsevier.
7. Vivek Sahai & Vikas Bist (2013), Linear Algebra (2^{nd} Edition) Narosa Publishing.
8. Serge Lang (2005), Introduction to Linear Algebra (2^{nd} Edition), Springer India.
9. T. K. Manicavasagam Pillai and K S Narayanan, Modern Algebra Volume 2.

MATDSCP 6.1: Practical's on Linear Algebra and Calculus of Variation	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 56 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problem on Linear Algebra studied in **MATDSCT 6.1 by** using FOSS software's.
3. Acquire knowledge of applications of Linear Algebra through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS)

Suggested Software's: Maxima/Scilab /Python/R.

Suggested Programs:

1. Program to verify given ring is a commutative ring.
2. Program to verify given ring with/without zero divisors.
3. Program to verify given ring with/without unity
4. Program on linear combination of vectors.
5. Program to verify linear dependence and independence.
6. Program to find basis and dimension of the subspaces.
7. Program to verify if a function is linear transformation or not.
8. Program to find the matrix of linear transformation.
9. Program to find the Eigenvalues and Eigenvectors of a given linear transformation.
10. Program to verify variational problem using Euler's general formula.
11. Program to verify variational problems using particular forms of Euler's equations independent of both x and y
12. Program to verify variational problems using particular forms of Euler's equation with equations independent of y.

MATDSCT 6.2: Numerical Analysis	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 56 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes:

The overall expectation from this course is that the student will get equipped with certain numerical techniques for various computations such as finding roots, system of algebraic equation, finding the integrals and derivatives. Some broader course outcomes are listed as follows. At the end of this course, the student will be able to

1. Describe various operators arising in numerical analysis such as differenceoperators, shift operators and so on.
2. Articulate the rationale behind various techniques of numerical analysis such as infinding roots, integrals and derivatives.
3. Reproduce the existing algorithms for various tasks as mentioned previously in numerical analysis.
4. Apply the rules of calculus and other areas of mathematics in justifying thetechniques of numerical analysis.
5. Solve problems using suitable numerical technique
6. Appreciate the profound applicability of techniques of numerical analysis in solving real life problems and also appreciate the way the techniques are modifiedto improve the accuracy.

Unit – I: Algebraic and Transcendental Equations

Errors - Significant digits, absolute, relative, percentage errors, rounding off and truncation errors (meanings and related problems), general error formula (derivation of formula and problems based on it), error in series approximation: Taylor series approximations (problems only), Solutions to algebraic and transcendental equations- Bisection method, Regula-Falsi method, iterative method Newton-Raphson method and secant method (Plain discussion of the rationale behind techniques and problems on their applications). **14 Hours**

Unit – II: System of Linear Algebraic Equations

Direct Methods – Gauss-elimination method, Gauss-Jordan elimination method and Tringularization: Crouts method; Iterative methods –Gauss-Jacobi method, Gauss- Seidel method, Successive-Over Relaxation method (SOR) method**.** Power method to find the largest eigenvalue and corresponding eigenvector. **14 Hours**

Unit – III: Polynomial Interpolations

Finite differences**.** Forward, backward and central differences and shift operators: definitions, properties and problems; Polynomial interpolation - Newton-Gregory forward and backward interpolation formulas, Gauss's Forward and backward interpolation formulas, Lagrange interpolation polynomial, Newton's divided differences and Newton's general interpolation formula (Discussion on setting up the polynomials, differences between them and problems on their applications). **14 Hours**

Unit-IV: Numerical Differentiation an Integration

Formula for derivatives (till second order) based on Newton-Gregory forward and backward interpolations (Derivations and problems based on them). Numerical Integration - General quadrature formula, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule and Weddell's rule (derivations for only general quadrature formula, trapezoidal rule and Simpson's $1/3^{rd}$ rule and problems on the applications of all formulas). **14 Hours**

Reference:

1. E. Isaacson and H. B. Keller, *Analysis of Numerical methods*, Dover Publications.
2. S. S. Sastry, *Introductory methods of Numerical Analysis*, 5th Edition, PHI Learning Private Limited.
3. E Kreyszig, *Advanced Engineering Mathematics*, Wiley India Pvt. Limited
4. B. S. Grewal, *Numerical Methods for Scientists and Engineers*, Khanna Publishers.
5. M. K. Jain, S. R. K. Iyengar and R. K. Jain, *Numerical Methods for Scientific and Engineering computation*, 4th Edition, New Age International
6. H. C. Saxena, *Finite Difference and Numerical Analysis*, S. Chand Publishers
7. B. D. Gupta, *Numerical Analysis*, Konark Publishers Pvt. Ltd.

MATDSCP 6.2: Practical's on Numerical Analysis	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 56 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problem on numerical Analysis studied in **MATDSCT 6.2 by** using FOSS software's.
3. Acquire knowledge of applications of Numerical Analysis through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS)

Suggested Software's: Maxima/Scilab /Python/R.

Suggested Programs:

1. Program to find root of an equation using bisection and Regula-Falsi methods.
2. Program to find root of an equation using Newton-Raphson and Secant methods.
3. Program to solve system of algebraic equations using Gauss-elimination method.
4. Program to solve system of algebraic equations using Gauss-Jordan method.
5. Program to solve system of algebraic equation using Gauss-Jacobimethod.
6. Program to solve system of algebraic equation using Gauss-Seidel method.
7. Program to solve the system of algebraic equations using SOR method.
8. Program to find the sums of powers of successive natural numbers using Newton – Gregory technique.
9. Program to find differentiation at specified point using Newton-Gregory interpolation method.
10. Program to find the missing value of table using Lagrange method.
11. Program to evaluate integral using Simpson's 1/3 and 3/8 rules.
12. Program to evaluate integral using Trapezoidal and Weddle rules