Sri Adichunchanagiri College of Arts and Commerce

Nagamangala, Mandya District-571432

DEPARTMENT OF MATHEMATICS

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 develops 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 develops the capability 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 various notions 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 real word problems.

PO 10 Ability to peruse advanced studies and research in pure and applied Mathematical sciences.

Deepa B. J
HOD OF MATHEMATICS
SAC COLLEGE OF ARTS
COMMERCE & SCIENCE
Nagamangala, Mandya Dist

PRINCIPAL
Sri Adichunchanagiri College
of Arts and Commerce
Nagamangala-571 432, Mandya Dist

Programme Specific Outcomes:

- Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.
- Inculcate mathematical reasoning.
- Prepare and motivate students for research studies in mathematics and related fields.
- Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.
- Provide advanced knowledge on topics in mathematics, empowering the students to pursue higher degrees at reputed academic institutions.
- Nurture problem solving skills, thinking, creativity through
- Assist students in preparing (personal guidance, books) for competitive exams.
- Learn *Free and Open Source Software (FOSS)* tools for computer programming
- Solve problem on algebra and calculus by using FOSS software's.
- Acquire knowledge of applications of algebra and calculus through FOSS
- Think in a critical manner.
- Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
- Formulate and develop mathematical arguments in a logical manner.
- Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.

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Nagamangala, Mandya District-571432

DEPARTMENT OF MATHEMATICS

YEAR:2016-2017

PAPER I: ALGEBRA I AND DIFFERENTIAL CALCULUS I	
Course Outcomes	• Apply the matrix theory to solve the system of linear equations. • Apply the knowledge of successive differentiation to solve the problems relative with standard formulae. • Apply Leibnitz theorem to find n^{th} differentiation of functions. • Apply the knowledge of reduction formulae and differentiation under integral sign by Leibnitz rule to solve integral equations. • Solve problems on matrices, differential equations and definite integral equations by using wxmaxima in Lab.
PAPER II: DIFFERENTIAL CALCULUS-II AND INTEGRAL CALCULUS I	
Course Outcomes	• Apply continuity and differentiability of a function at a point. • Apply Rolle's, Lagrange's mean value theorem to Calculate the limit of a function using L'Hospital rule. • Compute the integrals of a function of two and three independent variables along with applications.
Paper III: ALGEBRA II AND DIFFERENTIAL EQUATION I	
Course Outcomes	• Assess properties implied by the definitions of groups • Use various canonical types of groups (including cyclic groups and groups of permutation) • Analyze and demonstrate examples of subgroups, Normal Subgroups and quotient groups. • Obtain the solution of differential equations by the method of separation of variables, homogeneous , Linear and exact differential equations • Obtain an integrating factor which may reduce a given differential equation into an exact one and provide its Solution • Find the complementary function and particular integrals of Linear differential Equations
Paper IV: DIFFERENTIAL EQUATION II AND INTEGRAL CALCULUS II	
Course Outcomes	After completing the course the learner should be able to: • Method of Solution of the differential equation of the form dx/P = dy/Q = dz/R • Use Lagrange's method for solving the first order linear Partial differential equations • Learn the definition & concept of line integral . • Evaluations of double integral & triple integrals. • Find the volume of given surface by using triple integrals.
Paper V:REAL ANALYSIS AND APPLIED MATHEMATICS	

Course Outcomes	After completing the course the learner should be able to: • Understand the term Convergence. • Applies this term in to problems. • Illustrate the convergence properties of infinite series. • Test the convergence of infinite series by comparison tests, D 'Alembert's ratio test, Raabe's test. Cauchy's root test. • Definitions and basic properties of Laplace Transforms. • Convolution theorem & its applications. • Know that any periodic function can be expressed as a Fourier Series. • Know how to obtain Fourier Series of given Periodic function. • Expand even or odd function as half range cosine or sine fourier series.
Paper VI: ALGEBRA III AND REAL ANALYSIS	
Course Outcomes	On successful completion of the course the students should be able to: • Write precise and accurate Mathematical definitions of ring Theory. • Analyze & Demonstrate examples of ideals and quotient ring. • Use the concepts of isomorphism and homomorphism for rings. • Finding the greatest common divisor of polynomials. • Learn the definition of Riemann integral, upper sums and lower sums.
Paper VII:ALGEBRA IV AND CALCULUS III	
Course Outcomes	• Understand the idea about vectors space. • Analyze finite and infinite dimensional Vectors space and Subspaces over a field and their properties, including basis structure of vector spaces. • Use the definition and properties of linear transformation and matrices of linear transformations and change of basis including kernel, range and isomorphism. • Compute with the characteristic polynomials eigen vectors, eigen spaces. • Understand the definition of improper integrals . • Evaluation of improper integrals using Beta and gamma functions. • Differentiate vector fields. • Determine gradient of scalar point function curl and divergence of vector point functions.
Paper VIII: COMPLEX ANALYSIS AND NUMERICAL ANALYSIS	
Course Outcomes	Upon completion of the course the students should be able to: • Represent Complex Numbers algebraically and geometrically. • Apply the concept and consequences of analyticity and Cauchy-Riemann equation and results on harmonic functions. • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem. • Understand the concepts of floating point errors in representing numbers solving equations using different methods. • Solve the problems using numerical Differentiation and Integration. • Solve the system of linear equations by using numerical methods.

Sri Adichunchanagiri College of Arts and Commerce

Nagamangala, Mandya District-571432

DEPARTMENT OF MATHEMATICS

YEAR:2017-2018

PAPER I: ALGEBRA I AND DIFFERENTIAL CALCULUS I	
Course Outcomes	• Apply the matrix theory to solve the system of linear equations. • Apply the knowledge of successive differentiation to solve the problems relative with standard formulae. • Apply Leibnitz theorem to find n^{th} differentiation of functions. • Apply the knowledge of reduction formulae and differentiation under integral sign by Leibnitz rule to solve integral equations. • Solve problems on matrices, differential equations and definite integral equations by using wxmaxima in Lab.
PAPER II: DIFFERENTIAL CALCULUS-II AND INTEGRAL CALCULUS I	
Course Outcomes	• Apply continuity and differentiability of a function at a point. • Apply Rolle's, Lagrange's mean value theorem to Calculate the limit of a function using L'Hospital rule. • Compute the integrals of a function of two and three independent variables along with applications.
Paper III: ALGEBRA II AND DIFFERENTIAL EQUATION I	
Course Outcomes	• Assess properties implied by the definitions of groups • Use various canonical types of groups (including cyclic groups and groups of permutation) • Analyze and demonstrate examples of subgroups, Normal Subgroups and quotient groups. • Obtain the solution of differential equations by the method of separation of variables, homogeneous , Linear and exact differential equations • Obtain an integrating factor which may reduce a given differential equation into an exact one and provide its Solution • Find the complementary function and particular integrals of Linear differential Equations
Paper IV: DIFFERENTIAL EQUATION II AND INTEGRAL CALCULUS II	
Course Outcomes	After completing the course the learner should be able to: • Method of Solution of the differential equation of the form $dx/P = dy/Q = dz/R$ • Use Lagrange's method for solving the first order linear Partial differential equations • Learn the definition & concept of line integral . • Evaluations of double integral & triple integrals. • Find the volume of given surface by using triple integrals.
Paper V:REAL ANALYSIS AND APPLIED MATHEMATICS	
Course Outcomes	After completing the course the learner should be able to: • Understand the term Convergence. • Applies this term in to problems. • Illustrate the convergence properties of infinite series. • Test the convergence of infinite series by comparison tests, D 'Alembert's ratio test, Raabe's test. Cauchy's root test. • Definitions and basic properties of Laplace Transforms.

	• Convolution theorem & its applications. • Know that any periodic function can be expressed as a Fourier Series. • Know how to obtain Fourier Series of given Periodic function. • Expand even or odd function as half range cosine or sine fourier series.
Paper VI: ALGEBRA III AND REAL ANALYSIS	
Course Outcomes	On successful completion of the course the students should be able to: • Write precise and accurate Mathematical definitions of ring Theory. • Analyze & Demonstrate examples of ideals and quotient ring. • Use the concepts of isomorphism and homomorphism for rings. • Finding the greatest common divisor of polynomials. • Learn the definition of Riemann integral, upper sums and lower sums.
Paper VII:ALGEBRA IV AND CALCULUS III	
Course Outcomes	• Understand the idea about vectors space. • Analyze finite and infinite dimensional Vectors space and Subspaces over a field and their properties, including basis structure of vector spaces. • Use the definition and properties of linear transformation and matrices of linear transformations and change of basis including kernel, range and isomorphism. • Compute with the characteristic polynomials eigen vectors, eigen spaces. • Understand the definition of improper integrals . • Evaluation of improper integrals using Beta and gamma functions. • Differentiate vector fields. • Determine gradient of scalar point function curl and divergence of vector point functions.
Paper VIII: COMPLEX ANALYSIS AND NUMERICAL ANALYSIS	
Course Outcomes	Upon completion of the course the students should be able to: • Represent Complex Numbers algebraically and geometrically. • Apply the concept and consequences of analyticity and Cauchy-Riemann equation and results on harmonic functions. • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem. • Understand the concepts of floating point errors in representing numbers solving equations using different methods. • Solve the problems using numerical Differentiation and Integration. • Solve the system of linear equations by using numerical methods.

Sri Adichunchanagiri College of Arts and Commerce

Nagamangala, Mandya District-571432

DEPARTMENT OF MATHEMATICS

YEAR: 2018-19

PAPER I: ALGEBRA I AND CALCULUS I	
Course Outcomes	• Apply the matrix theory to solve the system of linear equations. • Apply the knowledge of successive differentiation to solve the problems relative with standard formulae. • Apply Leibnitz theorem to find n^{th} differentiation of functions. • Apply the knowledge of reduction formulae and differentiation under integral sign by Leibnitz rule to solve integral equations. • Solve problems on matrices, differential equations and definite integral equations by using wxmaxima in Lab.
PAPER II: CALCULUS-II AND THEORY OF NUMBERS	
Course Outcomes	• Apply continuity and differentiability of a function at a point. • Apply Rolle's, Lagrange's mean value theorem to Calculate the limit of a function using L'Hospital rule. • Compute the integrals of a function of two and three independent variables along with applications.
Paper III: ALGEBRA II AND DIFFERENTIAL EQUATION I	
Course Outcomes	• Assess properties implied by the definitions of groups • Use various canonical types of groups (including cyclic groups and groups of permutation) • Analyze and demonstrate examples of subgroups, Normal Subgroups and quotient groups. • Obtain the solution of differential equations by the method of separation of variables, homogeneous , Linear and exact differential equations • Obtain an integrating factor which may reduce a given differential equation into an exact one and provide its Solution • Find the complementary function and particular integrals of Linear differential Equations
Paper IV: DIFFERENTIAL EQUATION II AND INTEGRAL CALCULUS II	
Course Outcomes	After completing the course the learner should be able to: • Method of Solution of the differential equation of the form $dx/P = dy/Q = dz/R$ • Use Lagrange's method for solving the first order linear Partial differential equations • Learn the definition & concept of line integral . • Evaluations of double integral & triple integrals. • Find the volume of given surface by using triple integrals. • Criterion for integrability. • Fundamental theorem of integral calculus. • Learn First and Second Mean Value theorems of integral calculus
Paper V:REAL ANALYSIS AND APPLIED MATHEMATICS	
Course Outcomes	After completing the course the learner should be able to: • Understand the term Convergence. • Applies this term in to problems. • Illustrate the convergence properties of infinite series.

	• Test the convergence of infinite series by comparison tests, D 'Alembert's ratio test, Raabe's test. Cauchy's root test. • Definitions and basic properties of Laplace Transforms. • Convolution theorem & its applications. • Know that any periodic function can be expressed as a Fourier Series. • Know how to obtain Fourier Series of given Periodic function. • Expand even or odd function as half range cosine or sine fourier series.
Paper VI: ALGEBRA III AND REAL ANALYSIS	
Course Outcomes	On successful completion of the course the students should be able to: • Write precise and accurate Mathematical definitions of ring Theory. • Analyze & Demonstrate examples of ideals and quotient ring. • Use the concepts of isomorphism and homomorphism for rings. • Finding the greatest common divisor of polynomials. • Learn the definition of Riemann integral, upper sums and lower sums.
Paper VII:ALGEBRA IV AND CALCULUS III	
Course Outcomes	• Understand the idea about vectors space. • Analyze finite and infinite dimensional Vectors space and Subspaces over a field and their properties, including basis structure of vector spaces. • Use the definition and properties of linear transformation and matrices of linear transformations and change of basis including kernel, range and isomorphism. • Compute with the characteristic polynomials eigen vectors, eigen spaces. • Understand the definition of improper integrals . • Evaluation of improper integrals using Beta and gamma functions. • Differentiate vector fields. • Determine gradient of scalar point function curl and divergence of vector point functions.
Paper VIII: COMPLEX ANALYSIS AND NUMERICAL ANALYSIS	
Course Outcomes	Upon completion of the course the students should be able to: • Represent Complex Numbers algebraically and geometrically. • Apply the concept and consequences of analyticity and Cauchy-Riemann equation and results on harmonic functions. • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem. • Understand the concepts of floating point errors in representing numbers solving equations using different methods. • Solve the problems using numerical Differentiation and Integration. • Solve the system of linear equations by using numerical methods.

Sri Adichunchanagiri College of Arts and Commerce
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DEPARTMENT OF MATHEMATICS

YEAR:2019-2020

PAPER I: ALGEBRA I AND CALCULUS I	
Course Outcomes	• Apply the matrix theory to solve the system of linear equations. • Apply the knowledge of successive differentiation to solve the problems relative with standard formulae. • Apply Leibnitz theorem to find n^{th} differentiation of functions. • Apply the knowledge of reduction formulae and differentiation under integral sign by Leibnitz rule to solve integral equations. • Solve problems on matrices, differential equations and definite integral equations by using wxmaxima in Lab.
PAPER II: CALCULUS-II AND THEORY OF NUMBERS	
Course Outcomes	• Apply continuity and differentiability of a function at a point. • Apply Rolle's, Lagrange's mean value theorem to Calculate the limit of a function using L'Hospital rule. • Compute the integrals of a function of two and three independent variables along with applications.
Paper III: ALGEBRA II AND DIFFERENTIAL EQUATION I	
Course Outcomes	• Assess properties implied by the definitions of groups • Use various canonical types of groups (including cyclic groups and groups of permutation) • Analyze and demonstrate examples of subgroups, Normal Subgroups and quotient groups. • Obtain the solution of differential equations by the method of separation of variables, homogeneous , Linear and exact differential equations • Obtain an integrating factor which may reduce a given differential equation into an exact one and provide its Solution • Find the complementary function and particular integrals of Linear differential Equations
Paper IV: DIFFERENTIAL EQUATION II AND INTEGRAL CALCULUS II	
Course Outcomes	After completing the course the learner should be able to: • Method of Solution of the differential equation of the form dx/P = dy/Q = dz/R • Use Lagrange's method for solving the first order linear Partial differential equations • Learn the definition & concept of line integral . • Evaluations of double integral & triple integrals. • Find the volume of given surface by using triple integrals. • Criterion for integrability. • Fundamental theorem of integral calculus. • Learn the definition of Riemann integral, upper sums and lower sums. • Learn First and Second Mean Value theorems of integral calculus
Paper V:REAL ANALYSIS AND APPLIED MATHEMATICS	
Course Outcomes	After completing the course the learner should be able to: • Understand the term Convergence.

	• Applies this term in to problems. • Illustrate the convergence properties of infinite series. • Test the convergence of infinite series by comparison tests, D 'Alembert's ratio test, Raabe's test. Cauchy's root test. • Definitions and basic properties of Laplace Transforms. • Convolution theorem & its applications. • Know that any periodic function can be expressed as a Fourier Series. • Know how to obtain Fourier Series of given Periodic function. • Expand even or odd function as half range cosine or sine fourier series.
Paper VI: ALGEBRA III AND REAL ANALYSIS	
Course Outcomes	On successful completion of the course the students should be able to: • Write precise and accurate Mathematical definitions of ring Theory. • Analyze & Demonstrate examples of ideals and quotient ring. • Use the concepts of isomorphism and homomorphism for rings. • Finding the greatest common divisor of polynomials. • Learn the definition of Riemann integral, upper sums and lower sums.
Paper VII:ALGEBRA IV AND CALCULUS III	
Course Outcomes	• Understand the idea about vectors space. • Analyze finite and infinite dimensional Vectors space and Subspaces over a field and their properties, including basis structure of vector spaces. • Use the definition and properties of linear transformation and matrices of linear transformations and change of basis including kernel, range and isomorphism. • Compute with the characteristic polynomials eigen vectors, eigen spaces. • Understand the definition of improper integrals . • Evaluation of improper integrals using Beta and gamma functions. • Differentiate vector fields. • Determine gradient of scalar point function curl and divergence of vector point functions.
Paper VIII: COMPLEX ANALYSIS AND NUMERICAL ANALYSIS	
Course Outcomes	Upon completion of the course the students should be able to: • Represent Complex Numbers algebraically and geometrically. • Apply the concept and consequences of analyticity and Cauchy-Riemann equation and results on harmonic functions. • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem. • Understand the concepts of floating point errors in representing numbers solving equations using different methods. • Solve the problems using numerical Differentiation and Integration. • Solve the system of linear equations by using numerical methods.

Sri Adichunchanagiri College of Arts and Commerce
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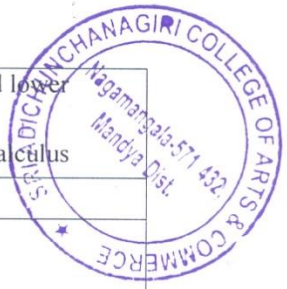
DEPARTMENT OF MATHEMATICS

YEAR:2020-2021

PAPER I: ALGEBRA I AND CALCULUS I	
Course Outcomes	• Apply the matrix theory to solve the system of linear equations. • Apply the knowledge of successive differentiation to solve the problems relative with standard formulae. • Apply Leibnitz theorem to find n^{th} differentiation of functions. • Apply the knowledge of reduction formulae and differentiation under integral sign by Leibnitz rule to solve integral equations. • Solve problems on matrices, differential equations and definite integral equations by using wxmaxima in Lab.
PAPER II: CALCULUS-II AND THEORY OF NUMBERS	
Course Outcomes	• Apply continuity and differentiability of a function at a point. • Apply Rolle's, Lagrange's mean value theorem to Calculate the limit of a function using L'Hospital rule. • Compute the integrals of a function of two and three independent variables along with applications.
Paper III: ALGEBRA II AND DIFFERENTIAL EQUATION I	
Course Outcomes	• Assess properties implied by the definitions of groups • Use various canonical types of groups (including cyclic groups and groups of permutation) • Analyze and demonstrate examples of subgroups, Normal Subgroups and quotient groups. • Obtain the solution of differential equations by the method of separation of variables, homogeneous , Linear and exact differential equations • Obtain an integrating factor which may reduce a given differential equation into an exact one and provide its Solution • Find the complementary function and particular integrals of Linear differential Equations
Paper IV: DIFFERENTIAL EQUATION II AND INTEGRAL CALCULUS II	
Course Outcomes	After completing the course the learner should be able to: • Method of Solution of the differential equation of the form dx/P = dy/Q = dz/R • Use Lagrange's method for solving the first order linear Partial differential equations • Learn the definition & concept of line integral . • Evaluations of double integral & triple integrals. • Find the volume of given surface by using triple integrals. • Criterion for integrability. • Fundamental theorem of integral calculus.



	• Learn the definition of Riemann integral, upper sums and lower sums. • Learn First and Second Mean Value theorems of integral calculus
PAPER V: DSE: REAL ANALYSIS II AND ALGEBRA –I	
Course Outcomes	After completing the course the learner should be able to: o Understand the term Convergence. o Applies this term in to problems. o Illustrate the convergence properties of infinite series. o Test the convergence of infinite series by comparison tests, • D 'Alembert's ratio test, Raabe's test. Cauchy's root test. • Write precise and accurate Mathematical definitions of ring Theory. • Analyze & Demonstrate examples of ideals and quotient ring. • Use the concepts of isomorphism and homomorphism for rings. • Finding the greatest common divisor of polynomials.
SEC PAPER: APPLIED MATHEMATICS	
Course Outcomes	After completing the course the learner should be able to: • Definitions and basic properties of Laplace Transforms. • Convolution theorem & its applications. • Know that any periodic function can be expressed as a Fourier Series. • Know how to obtain Fourier Series of given Periodic function. • Expand even or odd function as half range cosine or sine fourier series.
SEC PAPER: NUMERICAL ANALYSIS	
Course Outcomes	After completing the course the learner should be able to: • Understand the concepts of floating point errors in representing numbers solving equations using different methods. • Solve the problems using numerical Differentiation and Integration. • Solve the system of linear equations by using numerical methods. • Define Basic concepts of operators Δ,E, ∇
PAPER VI: DSE: ALGEBRA-IV AND COMPLEX ANALYSIS-I	
Course Outcomes	Upon completion of the course the students should be able to: • Understand the idea about vectors space. • Analyze finite and infinite dimensional Vectors space and Subspaces over a field and their properties, including basis structure of vector spaces. • Use the definition and properties of linear transformation and matrices of linear transformations and change of basis including kernel, range and isomorphism. • Compute with the characteristic polynomials eigen vectors, eigen spaces • Represent Complex Numbers algebraically and geometrically. • Apply the concept and consequences of analyticity and Cauchy-Riemann equation and results on harmonic functions.

	• Define Bilinear transformation, cross ratio, fixed point. • Write the bilinear transformation which maps real line to real line, unit circle to unit circle, real line to unit circle.
SEC PAPER I:COMPLEX ANALYSIS II AND IMPROPER INTEGRALS	
Course Outcomes	Understand the definition of improper integrals . • Calculate of the complex and real integrals. • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem • Evaluation of improper integrals using Beta and gamma functions. • Differentiate vector fields. • Determine gradient of scalar point function curl and divergence of vector point functions.
SEC PAPER II:GRAPH THEORY	
Course Outcomes	• Describe the origin of Graph Theory. • Illustrate different types of graph theory. • Explain independent sets and covering sets and some basic theorems. • Discuss degree sequences and operations on graphs. • Explain connectedness and components and some theorems. • Characterize tree. • Derive some properties of planarity and Euler's formula. • Find chromatic number and chromatic polynomials for graphs. • Prove Five colour theorem. • Explain basic properties of directed graphs.
Paper V: DSE: REAL ANALYSIS II AND ALGEBRA-III	
Course Outcomes	After completing the course the learner should be able to: • Understand the term Convergence. • Applies this term into problems. • Illustrate the convergence properties of infinite series. • Test the convergence of infinite series by comparison tests, D 'Alembert's ratio test, Raabe's test. Cauchy's root test. • Write precise and accurate Mathematical definitions of ring Theory. • Analyze & Demonstrate examples of ideals and quotient ring. • Use the concepts of isomorphism and homomorphism for rings
SEC I: APPLIED MATHEMATICS	
Course Outcomes	. • Definitions and basic properties of Laplace Transforms. • Convolution theorem & its applications. • Know that any periodic function can be expressed as a Fourier Series. • Know how to obtain Fourier Series of given Periodic function. • Expand even or odd function as half range cosine or sine fourier series.
SEC II:NUMERICAL ANALYSIS	

Course Outcomes	• Understand the concepts of floating point errors in representing numbers solving equations using different methods. • Solve the problems using numerical Differentiation and Integration. • • Solve the system of linear equations by using numerical methods.
Paper VI:DSE: ALGEBRA IV AND COMPLEX ANALYSIS I	
Course Outcomes	• Understand the idea about vectors space. • Analyze finite and infinite dimensional Vectors space and Subspaces over a field and their properties, including basis structure of vector spaces. • Use the definition and properties of linear transformation and matrices of linear transformations and change of basis including kernel, range and isomorphism. • Compute with the characteristic polynomials eigen vectors, eigen spaces. • Represent Complex Numbers algebraically and geometrically. • Apply the concept and consequences of analyticity and Cauchy-Riemann equation and results on harmonic functions. • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem. • solving the bilinear transformation.
SEC I: COMPLEX ANALYSIS I AND IMPROPER INTEGRALS	
Course Outcomes	• Describe the basic properties of complex integration and having the ability to compute such integrals. • Give the main ideas in the proof of CIT, Direct consequence of Cauchy's theorem, the Cauchy's Inequality, liouville's theorem. • Understand the definition of improper integrals . • Evaluation of improper integrals using Beta and gamma functions.
SEC II: GRAPH THEORY	
Course Outcomes	• Defines and finds a graph, identifying edges and vertices. • Able to define the basic concepts of graphs. • Defines a bipartite graphs. • Explains lists basic properties of trees. • Able to understand eulerian and Hamiltonian graphs.