

Semester : II **Major Core II**
Name of the Course : Classical Algebra and Integral Calculus
Course Code : MC2021

No. of hours per week	Credits	Total No. of hours	Marks
6	5	90	100

Objectives:

1. To give a sound knowledge in Classical Algebra.
2. To solve problems in applications of Integral Calculus.

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	recall the fundamentals of algebraic equations and rules of integration.	PSO - 1	R
CO - 2	apply fundamental theorem of algebra in framing and solving equations	PSO - 5	U
CO - 3	choose appropriate method for transformation of equations	PSO - 2	Ap
CO - 4	develop the skill of evaluation of double and triple integrals over different regions	PSO - 3	Ap
CO - 5	identify Beta, Gamma functions and utilize them for the evaluation of definite integrals	PSO - 5	Ap,E
CO - 6	develop the Fourier Series expansion in any interval and apply the same for solving technical and physical problems	PSO - 4	Ap, An

Total contact hours: 90 (Including lectures, assignments and tests)

Unit	Section	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/evaluation
I	Theory of equations					
	1	Preliminaries about equations and remainder theorem Fundamental theorem of Algebra Problems based on remainder theorem Problems based on Fundamental theorem of Algebra	4	Explain the primary concepts of Fundamental theorem of Algebra Problems based on remainder theorem	Lecture with Illustration	Evaluation through appreciative inquiry
	2	In an equation with real coefficients, imaginary roots occur in pairs In an equation with rational coefficients,	3	To distinguish between imaginary roots occur in pairs and irrational roots occur in pairs	Lecture	Evaluation through quizzes and discussions.

		irrational roots occur in pairs Relations between roots and coefficients of equations				
	3	Forming the equation whose roots are functions of roots of the given equation Forming the equation whose roots are in A.P Forming the equation whose roots are in G.P. Forming the equation whose roots are in H.P	4	To understand the Formation of the equation whose roots are in A.P,GP,HP	Lecture with Illustration	Slip Test
	4	Symmetric functions of the roots Sum of r^{th} powers of the roots Newton's theorem on the sum of the powers of the roots. Problems based on Newton's theorem	4	To understand Newton's theorem on the sum of the powers of the roots	Discussion with Illustration	Quiz and Test
II	Transformation of Equations					
	1	Transform an equation into another whose roots are the roots of the given equation with signs changed Transform an equation into another whose roots are m times the roots of the given equation Reciprocal equations Standard form of reciprocal equations	4	To identify the Reciprocal equations Standard form of reciprocal equations	Lecture with Eamples	Evaluation through discussions.
	2	Any reciprocal equation can be reduced to a Standard reciprocal equation Solving different types of reciprocal equations Increasing or	4	To solve different types of reciprocal equations	Lecture	Evaluation through appreciative inquiry

		decreasing the roots of a given equation by a given quantity				
	3	Removal of terms Descarte's rule of signs Descarte's rule of signs for negative roots Problems related to Descarte's rule of signs	4	To calculate problems related to Descarte's rule of signs	Lecture with Illustration	Formative Assessment Test
	4	Rolle's theorem. Problems related to Rolle's theorem.	3	To calculate problems related to Rolle's theorem	Group Discussion	Slip Test
III	Double integrals					
	1	Introduction about integration and Double integrals Evaluation of double integrals with constant limits in cartesian co-ordinates Evaluation of double integrals with constant limits in polar co-ordinates	3	Explain the primary concepts of Double integrals	Lecture with Illustration	Evaluation through discussions.
	2	Evaluation of double integrals with variable limits in cartesian co-ordinates Evaluation of double integrals with variable limits in polar co-ordinates Evaluation of double integrals over a specified region bounded by straight lines	4	Calculate the integrals over a specified region bounded by straight lines	Lecture with Illustration	Evaluation through appreciative inquiry
	3	Evaluation of double integrals over a specified region bounded by different curves Working rule for changing the order of integration Problems on changing	4	To apply the double integrals over a specified region bounded by different curves	Lecture	Formative Assessment Test

		the order of integration				
	4	Introduction about triple integrals Evaluation of double integrals with constant limits Evaluation of double integrals with variable limits	4	Evaluate the double integrals and triple integrals	Lecture and group discussion	Slip Test
IV	Beta and Gamma functions					
	1	Definition and existence of Beta and Gamma functions Properties of Gamma function Properties of Beta function Relation between Beta and Gamma functions	4	Explain the primary concepts of Beta and Gamma functions	Lecture with Illustration	Evaluation through discussions.
	2	Computation of Beta and Gamma functions Evaluation of integrals using properties of Gamma function Equivalent definitions of Beta function	4	To understand the theorems and problems based on Beta and Gamma functions	Lecture and group discussion	Evaluation through Assignment
	3	Evaluation of integrals using properties of Beta function Finding the value of standard definite integrals in terms of Beta and Gamma functions	4	To know about properties of Beta function	Lecture with Illustration	Formative Assessment Test
	4	Duplication formula Deductions using Duplication formula	2	To understand Duplication formula	Lecture with Illustration	Slip Test
V	Fourier series					
	1	Definition and basic properties of odd and even functions Introduction of Fourier series expansion Computation of Fourier coefficients	4	Explain the basic properties of odd and even functions	Lecture	Evaluation through discussions.
	2	Development of	4	To understand Fourier	Lecture	Formative

		Fourier series over an interval of length 2π Deduction of sum of series from Fourier series expansion Introduction of half range Fourier series expansion		series expansion and half range Fourier series expansion	with Illustration	Assessment test
	3	Development of half range sine series over an interval of length π Development of half range cosine series over an interval of length π Deduction of sum of series from half range Fourier series expansion	3	To calculate Problems based on half range sine, cosine series over an interval of length π	Lecture with Illustration	Slip Test
	4	Development of Fourier series over an arbitrary interval Development of half range sine series over an arbitrary interval Development of half range cosine series over an arbitrary interval	4	To differentiate half range sine series over an arbitrary interval And half range cosine series over an arbitrary interval	Lecture with Illustration	Home Assignment

Course Instructor: Dr.L.Jesmalar
Course Instructor: Ms. V. Princy Kala
& Ms. V.G. Michael Florance

HoD:Dr. V. M. Arul Flower Mary
HoD(SF): Mrs. J. Anne Mary Leema

Semester : II

Allied II

Name of the Course: Vector Calculus and Differential Equations(for Physics and Chemistry)

Subject code :MA2021

No. of hours per week	Credits	Total No. of hours	Marks
6	5	90	100

Objectives:

1. To introduce the concept of vector operators.
2. To impart the mathematical knowledge essential for solving problems in Physical Science.

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	explain the physical meaning and properties of curl and divergence	PSO - 1	U
CO - 2	practice the computation of line integrals, surface integrals	PSO - 2	Ap
CO - 3	use computational tools to solve problems and applications of partial differential equations of first order.	PSO - 2	Ap
CO - 4	find the complementary function and particular integral of a differential equation by using appropriate methods.	PSO - 5	U
CO - 5	use Laplace transform and their inverse to solve differential equations.	PSO - 3	Ap

Total contact hours: 90 (Including lectures, assignments and tests)

Unit	Section	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/ evaluation
I	Vector Differentiation					
	1	Revision of dot and cross product of vectors, Definition and theorems on differentiation of Vectors	4	To recall the operations on vectors and understand its functions	Lecture with Illustration	Brainstorming
	2	Gradient of a scalar function and its properties, Problems based on Gradient	3	To study gradient in detail and apply its properties to solve problems	Lecture. Group discussion	Appreciative inquiry
	3	Equation of tangent plane and normal line for a single surface, Equation of	4	To understand the tangent plane and normal line and its various functions	Lecture, Small groups	Test

		tangent line and normal plane for the intersection of two surfaces, Angle between two surfaces				
	4	Divergence of vectors and its properties, Curl of vectors and its properties, Solenoidal and irrotational vectors	4	To study in detail divergence, curl, solenoidal and irrotational vectors	Lecture, Jigsaw	Quiz
II	Vector Integration					
	1	Definition of line integrals and work done by a force, Parametric equation of curves	3	To practice the computation of line integrals	Lecture, problem	Slip test
	2	Evaluation of line integrals over curves in a plane, Evaluation of line integrals over curves in a surface	5	To evaluate line integrals over different surface	Inquiry based	Assignment
	3	Computation of work done by a force, Projection of a surface over a plane	3	To compute work done and understand projection	Lecture, inductive method	Formative Assessment Test
	4	Definition of surface integrals, Evaluation of surface integrals over a plane	4	To practice the computation of surface integrals	Group Discussion	Seminar
III	Linear Differential equations					
	1	Introduction of Linear Differential equations with constant coefficients, Formation of auxillary equation and finding the complementary function	4	To study the basics of linear differential equations and to find the complementary function by using an appropriate method	Lecture, Debate	Multiple choice questions

	2	Finding the particular integral for e^{ax} , Finding the particular integral for $\cos ax$, $\sin ax$	4	To find the particular integral of a differential equation by using an appropriate method	Lecture with Illustration	Test
	3	Finding the particular integral for $e^{ax}f(x)$, Finding the particular integral for $x^n f(x)$	3	To find the particular integral of a differential equation by using an appropriate method	Lab	Slip test
	4	Introduction of homogeneous linear equations, Conversion of homogeneous linear equations into linear differential equations with constant coefficients	4	To study few methods to convert the homogeneous linear equations into differential equations	Group Discussion	Formative Assessment Test
IV	Partial Differential equations					
	1	Introduction of Partial differential equations, Formation of Partial differential equations by eliminating the unknown constants,	3	To understand the basics and the formation of partial differential equations	Lecture with Illustration	Quiz
	2	Formation of Partial differential equations by eliminating the arbitrary functions, Methods of solving Partial differential equations	3	To study the methods of formation and the solution of partial differential equations	Lecture and small groups	Test
	3	Standard form of Lagrange's equation, General solution of Lagrange's equation	3	To study about Lagrange's equation and the methods to find its solutions	Discussion	Test
	4	Solving Lagrange's equation by method	3	To use computational tool to solve problems	Lecture and	Brain storming

		of grouping		and applications of partial differential equation of first order	Discussion	
	5	Solving Lagrange's equation by method of multipliers	3	To use computational tool to solve problems and applications of partial differential equation of first order	Lecture with Illustration	Test
V	Laplace Transform					
	1	Definition of Laplace Transform, Properties of Laplace Transform	3	To know the basics and the properties of Laplace Transform	Lecture and Debate	Test
	2	Computation of Laplace Transform of standard functions, Problems on Laplace Transform	3	To solve problems on Laplace Transform	Lecture with Illustration	Formative Assessment test
	3	Definition of Inverse Laplace Transform, Properties of Inverse Laplace Transform	3	To know the basics and the properties of Inverse Laplace Transform	Lecture and Lab	Short test
	4	Computation of Inverse Laplace Transform of specific functions, Problems on Inverse Laplace Transform	3	To use the Inverse Laplace Transform to solve the differential equation	Lecture and small groups	Assignment
	5	Solving Linear Differential equations using Laplace Transform	3	To use Laplace transform to solve the differential equation	Lecture with Illustration	Quiz and Test

Course Instructor: Dr. K. Jeya Daisy

HoD:Dr. V. M. Arul Flower Mary

HoD(SF): Mrs. J. Anne Mary Leema

Semester **II**
 Name of the Course : **Quantitative Aptitude - II (NME)**
 Course Code : **MNM202**

No. of hours per week	Credits	Total No. of hours	Marks
4	2	60	100

Objectives: 1.To develop the quantitative aptitude of the students
 2.To solve problems needed for various competitive examinations.

Course Outcome

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	frame equations and solve problems involving ratios and fractions.	PSO - 2	Ap
CO - 2	calculate the area and compare the objects on the basis of their size and area.	PSO - 1	Ap
CO - 3	change the form of the number using logarithm and make tedious and confusing calculations simple.	PSO - 4	An
CO - 4	have sufficient knowledge about the basis of calculation.	PSO - 2	U, Ap
CO - 5	study the concept related to time, speed and distance.	PSO - 4	Ap

Total contact hours: 30 (Including lectures, assignments and tests)

Unit	Section	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/evaluation
I	Problems on Numbers					
	1.	Problems on Numbers	3	To understand the basic concepts of numbers	Lecture thro google meet	Online Test
	2.	Framing and solving equations involving unknown numbers	3	To frame and solve equations	Lecture thro google meet	Online quiz, Assignment
II	Problems on Trains					
	1.	Problems on Trains	2	To study basic concepts	Lecture thro google meet	Online Test, Assignment
	2.	Time taken by a train to cover	2	To solve problems on time taken by a train to	Lecture thro google meet	Online Quiz

		l metres, $l + b$ metres		cover l metres, $l + b$ metres		
	3.	Relation between a train and stationary/moving body	2	To solve problems related to train and stationary/moving body	Lecture thro google meet	Formative Assessment online Test
III	Compound Interest					
	1.	Compound Interest	3	To recall the formulae of Compound interest	Lecture thro google meet	Online Test, Assignment
	2.	Interest compounded annually, half yearly and quarterly, different rates for different years	3	To employ the problems related interest compounded annually, half yearly and quarterly, different rates for different years	Lecture thro google meet	Formative Assessment online Test
IV	Logarithms					
	1.	Logarithms	2	To study the rules of Logarithms	Lecture thro google meet	Online Test
	2.	Properties of Logarithms	2	To solve problems by applying the properties of logarithms	Lecture thro google meet	Online Assignment
	3.	Common Logarithms	2	To solve problems of Common Logarithms	Lecture thro google meet and Group discussion	Online Quiz
V	Area					
	1.	Area - Results on Triangles- Pythagoras theorem, median, centroid	3	To learn the formulae and results	Lecture thro google meet	Online Quiz, Test
	2.	Area of a triangle and rectangle	3	To find Area of the given field	Lecture thro google meet	Formative Assessment online Test

Course Instructor: Dr. M.R. Angel Jebitha, Ms.J.C.Mahizha
Course Instructor: Dr.C.Jenila

HoD: Dr. V. M. Arul Flower Mary
HoD(SF): Mrs. J. Anne Mary Leema

Semester : IV
 Name of the Course : Groups and Rings
 Subject code : MC2041

Major Core V

No. of hours per week	Credit	Total No. of hours	Marks
6	5	90	100

Objectives: 1.To introduce the concepts of Group theory and Ring theory
 2. To gain more knowledge essential for higher studies in Abstract Algebra4.

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO – 1	recall the definitions of groups ,rings, functions and also examples of groups and rings	PSO - 1	R
CO – 2	explain the properties of groups, rings and different types of groups and rings	PSO - 1	U
CO – 3	develop proofs of results on Permutation groups ,Cyclic groups, Quotient group, Subgroups, subrings , quotient rings	PSO - 5	C
CO – 4	examine the properties of Ideals-Maximal and Prime ideals-Cosets-order of an element	PSO - 5	E
CO – 5	test the homomorphic and isomorphic properties of groups and rings	PSO - 4	An
CO – 6	develop the concepts of ordered integral domains and Unique Factorisation Domains	PSO - 5	E

Total contact hours: 90 (Including lectures, seminar and tests)

Unit	Section	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/ evaluation
I	Groups.					
	1.	Definition and examples on Groups	4	To understand the definition of groups	Lecture with Illustration	Evaluation through test
	2.	Definition and examples on Permutation Groups	3	To understand the definition permutation groups	Lecture	Q&A
	3.	Definition of cycle and theorem based on cycles	3	To understand the definition of cycle and theorem based on cycles	Lecture with Illustration	Open Book Assignment
	4.	Theorems on even and odd permutations	2	To understand and apply this theorem in various problems	Lecture with Illustration	Quiz

	5.	Definition examples, theorems and problems of sub groups	3	To understand the definition and theorems of sub groups	Lecture with Illustration	Group Discussion
	6.	Theorems on cyclic groups and problems based on cyclic groups	2	To learn the concepts of cyclic groups	Lecture with Illustration	Q&A
II	Order of an element and Normal Sub Groups					
	1.	Definition and Theorems on order of an Element	2	To understand the definition and theorems on order of an Element	Lecture with Illustration	Test
	2.	Problems on order of an element	2	To apply the concept of order of an element in problems	Lecture	Open book assignment
	3.	Definition of Cosets and problems on cosets	3	To understand the definition of cosets and problems on cosets	Lecture	Q&A
	4.	Lagrange's Theorem, Euler's Theorem, Fermats theorem	3	To learn Lagrange's Theorem, Euler's Theorem, Fermats theorem	Lecture	Formative Assessment Test
	5.	Normal subgroups - Definition and Examples	2	To know the definition of Normal subgroups	Group Discussion	Q&A
	6.	Problems and theorems on Normal Subgroups	2	To apply the Normal subgroups concept in problems	Lecture with Illustration	Slip Test
III	Isomorphism					
	1.	Definition, theorems and Examples of Isomorphism	4	To understand the definition and theorems based on Isomorphism	Lecture with Illustration	Quiz
	2.	Cayley's Theorem and Theorem on Automorphism and generators	3	To learn the Cayley's theorem and understand the concept of Automorphism and generators	Lecture	SipTest
	3.	Definition of Homomorphism and Examples	2	To learn the definition of Homomorphism and Examples	Lecture	Test
	4.	Fundamental Theorem of Homomorphism	3	To study the Fundamental Theorem of Homomorphism	Lecture	Q&A
	5.	Problems on Kernel	3	To apply Kernel concept in problems	Group Discussion	Brain Storming

IV		Rings				
	1.	Definition, Elementary properties and examples of Rings	3	To learn the definition of rings	Lecture with Illustration	Quiz
	2.	Problems based on Isomorphism of Rings	3	To get the idea of Isomorphism of Rings	Lecture and group discussion	Test
	3.	Types of Rings and Theorems	2	To identify the Types of Rings	Lecture with Illustration	Test
	4.	Examples of Skewfields and Theorems based on Skewfields	2	To apply Skewfields idea in problems	Lecture with Illustration	Formative Assessment Test
	5.	Definition and Theorems on integral Domains	1	To know about integral Domains	Lecture with Illustration	Assignment
	6.	Characteristic of a Ring	1	To interpret the Characteristic of a Ring	Lecture with Illustration	Quiz and Test
V		Sub Rings				
	1.	Definition and Examples of Sub Rings	2	To get the knowledge of subrings	Lecture with Illustration	Test
	2.	Problems and Theorems on Sub Rings	1	To develop the proof technique and solve problems.	Lecture with Illustration	Q&A
	3.	Definition, Theorems and Examples on ideals	3	To utilize the concept of ideals in examples	Lecture with Illustration	Open Book Assignment
	4.	Ordered integral Domains	3	To understand the Ordered integral Domains	Lecture with Illustration	Assignment
	5.	Maximal and Prime Ideals	2	To know about Maximal and Prime Ideals	Lecture with Illustration	Quiz and Test
	6.	Homomorphism of Rings	2	To learn the definition of Homomorphism of Rings	Lecture with Illustration	Assignment
	7.	Unique factorisation Domain	2	To understand and analyze about Unique factorisation Domain	Lecture with Illustration	Quiz and Test

Course Instructor(Aided): Dr.L.Jesmalar
Course Instructor(SF): Ms.V. Princy Kala Leema

HOD :Dr. V. M. Arul Flower Mary
HOD(SF) : Ms. J. Anne Mary

Semester : IV
 Name of the Course : Analytical Geometry - 3 Dimensions
 Subject code : MC2042

Major Core VI

No. of hours per week	Credits	Total No. of hours	Marks
5	5	75	100

Objectives:

1. To gain deeper knowledge in three dimensional Analytical Geometry.
2. To develop creative thinking, innovation and synthesis of information

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO – 1	recall the basic definitions and concepts of planes and lines	PSO - 1	R
CO – 2	demonstrate the Projection of the line joining two points, Cosines of the line joining two points and will be able to solve problems	PSO - 3	Ap
CO – 3	analyze the characteristics of a cone and the condition for a plane to touch the quadric cone	PSO - 2	An
CO – 4	draw three dimensional surfaces from the given information	PSO - 4	An
CO – 5	discuss the characteristics and properties of 3 - dimensional objects like sphere, cube etc	PSO - 1	U
CO – 6	develop the skill in 3 - dimensional geometry to gain mastery in related courses	PSO - 6	C

Total contact hours: 75 (Including lectures, assignments and tests)

Unit	Section	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/ evaluation
I	Direction cosines of a line					
	1.	Introduction and definition of distance between points and angle between two lines.	2	To understand the concept of distance between points and angle between two lines	Lecture	Test
	2.	Definition and problems related to Projection on a line, Direction cosines of a line	3	To understand the projection on a line and direction cosines of a line	Lecture with illustrations	Group Discussion
	3.	Definition of	3	To analyze the	Lecture	Test

		direction ratios and projection of the line joining two points.		equations of two skew lines in a simplified form		
	4.	Definition and Theorems related to direction cosines of the line joining the points	2	Acquire the knowledge about direction cosines of the line joining the points	Lecture	Test
	5.	Definition and problems based on conditions for perpendicularity and parallelism.	2	To practice various problems related to conditions for perpendicularity and parallelism.	Lecture with group discussion	Group discussion
II	The Plane					
	1.	Definition and problems based on Equation of a plane in different forms ,Intercept form , normal form	3	To understand the concepts Equation of a plane in different forms	Lecture	Test
	2.	Definition and problems related to Angle between the planes ,The ratio in which the plane divides the line joining the points	3	To understand the definition of the ratio in which the plane divides the line joining the points	Lecture	Q&A
	3.	Definition and problems on a plane through the line of intersection of two given planes	3	To practice various problems related to plane through the line of intersection of two given planes	Lecture	Formative Assessment Test
	4.	Problems based on length of perpendicular , Planes bisecting the angle between two planes.	3	Acquire the knowledge about the planes bisecting the angle between two planes.	Lecture with illustrations	Test
III	The Straight Line					
	1.	Definition and methods of finding	3	To understand the methods of finding	Lecture	Quiz

		equation of a line in different forms		equation of a line in different forms		
	2.	Problems based on the plane and the straight line	3	To compare the plane and the straight line	Lecture with illustration	Test
	3.	Definition and problems Angle between the lines, image of a line	3	To Know the concept of Angle between the lines	Lecture with group discussion	Brain storming
	4.	Problems based on Co-planarity of two lines	3	Acquire the knowledge about Co-planarity of two lines	Lecture with ppt	Assignment
IV	The Sphere					
	1.	Introduction and Illustrations based on equation of the sphere in its general form	3	To understand the sphere in its general form	Lecture	Quiz
	2.	Theorem and problems on determination of the centre and radius of a sphere	2	To determine the centre and radius of a sphere	Lecture	Test
	3.	The length of the tangent from the point to the sphere	2	To know about the length of the tangent from the point to the sphere	Lecture with illustration	Slip Test
	4.	Problems related to Section of sphere by a plane	3	To practice various problems related to Section of sphere by a plane	Lecture	Assignment
	5.	Definition of Intersection of two spheres and tangent plane.	2	Acquire the knowledge about Intersection of two spheres and tangent plane.	Lecture with illustration	Formative Assessment Test
IV	The Cone					
	1.	Definitions and problems in the equation of a surface and Cone	2	To understand about equation of a surface	Lecture with illustration	Test
	2.	Problems related to the intersection of a straight line and a quadric cone and Tangent plane	4	To practice various problems related to the tangent plane and normal	Lecture	Slip Test

		and normal				
	3.	Problems related to the condition for a plane to touch the quadric cone and the angle between the lines in which a plane cuts the cone	3	Acquire the knowledge about the condition for a plane to touch the quadric cone	Lecture	Assignment
	4.	Problems related to the condition that the cone has three mutually perpendicular generators.	3	To know about the condition that the cone has three mutually perpendicular generators.	Lecture	Quiz

Course Instructor(Aided)::Dr.J.Befija Minnie

Course Instructor(S.F):Dr. S. Kavitha

HOD:Dr. V. M. Arul Flower Mary

HOD(S.F) :Ms. J.Anne Mary Leema

SEMESTER IVName of the Course : **Applied Statistics (Allied)**Course Code : **MA2041**

No. of hours per week	Credit	Total No. of hours	Marks
5	5	75	100

Objectives: 1.To acquire the knowledge of correlation theory and testing hypothesis.

2. To solve research and application oriented problems.

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO – 1	identify and demonstrate appropriate sampling processes	PSO –2	Ap
CO – 2	recall the methods of classifying and analyzing data relative to single variable	PSO –4	R
CO - 3	describe the χ^2 distribution in statistics	PSO –3	U
CO - 4	distinguish between the practical purposes of a large and a small sample	PSO –1	An
CO - 5	understand that correlation coefficient is independent of the change of origin and scale	PSO –5	U

Total contact hours: 75 (Including lectures, assignments and tests)

Unit	Section	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/ evaluation
I	Correlation					
	1	Definitions and examples of correlation, Properties of correlation coefficient, Problems based on correlation	5	To Recall the definitions of correlation, Properties of correlation coefficient	Lecture	Quiz
	2	Definition of Rank correlation and proving Spearman's formula, Calculating Rank	3	To analyze Rank correlation and to solve the problems.	Lecture	Assignment

		correlation coefficient for the given data				
	3	Definition and results based on regression, Problems on regression	2	To solve the problems on regression	Lecture	Test
	4	Equation of regression lines	1	Apply regression lines in real life problems	Lecture with group discussion	Test
	5	Angle between the regression lines.	1	To Learn the Angle between the regression lines.	Lecture	Assignment
II	Test of significance					
	1	Introduction on test of significance, Sampling and its types, Definition on Sampling distribution and examples, Standard error for some sampling distributions	3	To solve problems related to test of significance	Lecture with group discussion	Test
	2	Testing of hypothesis and errors in testing of hypothesis, critical values for different levels of significance, Procedure for testing of a statistical hypothesis	3	To testing of hypothesis	Lecture	Quiz
	3	Explanation and Problems of test of significance for single proportions	3	To solve problems related to single proportions	Lecture	Formative Assessment
	4	Probable limits , Test of significance for difference of proportions	2	To solve problems related to Probable limits	Lecture	Test
	5	Problems on test of significance for difference of proportions	1	To solve problems related to difference proportions	Lecture with group discussion	Test
III	Test of significance for means					
	1	Test of significance for single mean if the standard deviation is	4	To Learn some methods to solve the Problems based on	Lecture	Test

		known, Problems based on confidence limits for population mean, Problems based on test of significance of means.		confidence limits for population mean and Problems based on test of significance of means.		
	2	Problems based on test of significance for difference of sample means, Test of significance for single standard deviation	2	To Learn some methods to solve the problems of test of significance for difference of sample means and single standard deviation	Lecture	Test
	3	Test of significance for equality of standard deviations of a normal population.	2	To learn normal population	Lecture	Test
	4	Problems based on test of significance for standard deviation	2	To test the significance for standard deviation	Lecture	Test
	5	Problems based on test of significance for correlation coefficient	3	To test the significance for correlation coefficient	Lecture	Test
IV	Test of significance for small samples					
	1	Distinguish large and small samples, Test of significance based on t-distribution, Test for the difference between the mean of a sample and that of a population.	3	To test the significance based on t-distribution, and the difference between the mean of a sample and that of a population.	Lecture with group discussion	Quiz
	2	Test for the difference between the means of two samples, Confidence limits for population mean	2	To solve problems related Confidence limits	Lecture	Assignment
	3	Problems based on confidence limits for population mean, Test of significance based on F-test	2	To learn the test of significance based on F-test	Lecture	Assignment
	4	Problems on test of significance based on F-test.	2	To solve problems on test of significance based on F-test.	Lecture	Formative Assessment

	5	Test of significance of an observed sample correlation, Problems on test of significance of an observed sample correlation.	2	To solve problems related to observed sample correlation.	Lecture	Assignment
V	Test based on χ^2-distribution					
	1	Introduction on test based on χ^2 -distribution, χ^2 -test for population variance	3	To Solve the problems related to χ^2 -test for population variance	Lecture	Quiz
	2	χ^2 -test to test the goodness of fit	2	To test the goodness of fit for χ^2 -test.	Lecture	Test
	3	Result on χ^2 -test to test the goodness of fit.	2	To learn the Result on χ^2 -test to test the goodness of fit.	Lecture	Formative Assessment
	4	Fit a Poisson distribution for the given data and to test the goodness of fit.	3	To analyze a Poisson distribution.	Lecture	Test
	5	Theorem based on the test for independence of attributes, Yate's Correction.	2	To solve the Problems based on independence of attributes.	Lecture	Assignment

Course Instructor (Aided): S. Antin Mary

HOD(Aided):Dr. V. M. Arul Flower

Mary Course Instructor(S.F): Dr. C. Jenila

HOD(S.F) :Ms. J. Anne Mary Leema

Teaching Plan (2019-2020)
Semester - VI

Name of the Course : Complex Analysis

Subject code : MC1761

No. of hours per week	Credit	Total No. of hours	Marks
6	5	90	100

Objectives

1. To introduce the basic concepts of differentiation and integration of complex functions.
2. To use these concepts in higher studies.

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	understand the geometric representation of complex numbers	PSO- 1	U
CO- 2	use differentiation rules to compute derivatives and express complex-differentiable functions as power series	PSO- 4	E
CO- 3	compute line integrals by using Cauchy's integral theorem and formula	PSO-3	E
CO -4	identify the isolated singularities of a function and determine whether they are removable, poles or essential	PSO-1	U
CO- 5	evaluate definite integrals by using residues theorem	PSO-8	E

Unit	Module	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/evaluation
I	1	Complex numbers – conjugation and modulus	5	To prove \mathbb{C} is a field and some inequalities	Lecture	Assignment
	2	Geometrical representation of complex numbers and n^{th} roots of complex numbers	5	To find magnitude, argument and n^{th} roots of complex numbers	Lecture, Group discussion	Test
	3	Circles and straight lines – general equations and problems	4	To obtain necessary and sufficient condition for the concept inverse points and reflection points	Lecture	Quiz
	4	Regions in the complex plane - definitions and examples	2	To identify regions in \mathbb{C}	Lecture with PPT	Assignment
	5	The extended complex plane - definition and problems	2	To determine the point on the sphere that represents the complex plane	Lecture	Test
II	1	Differentiability – definitions and theorems	3	To analyse basic properties of differentiability	Lecture	Assignment
	2	Cauchy Riemann equations – theorems and examples, Alternate forms of C.R equations – theorems and	7	To get necessary & sufficient condition for differentiability	Lecture	Formative Assessment

		problems				
	3	Analytic functions – definition and problems	5	To discuss some properties of analytic function	Lecture	Test
	4	Harmonic functions – definitions, theorems and problems	7	To find analytic functions	Lecture with group discussion	Assignment
	5	Bilinear transformations – elementary transformation and cross ratio	7	To determine the image of given region under bilinear transformation	Lecture with PPT	Test
III	1	Definite integral – definitions, theorems and examples	4	To evaluate definite integral	Lecture	Assignment
	2	Cauchy’s theorem – definition and theorems	5	To prove Cauchy’s theorems	Lecture	Test
	3	Cauchy’s integral formula – theorems and problems	5	To evaluate integrals	Lecture with group discussion	Test
IV	1	Taylor’s series-	5	To expand given function as Taylor’s series	Lecture	Assignment

		Taylor's theorem and problems			with group discussion	
	2	Laurent's Series – Laurent's theorem and problems	5	To expand given function as Laurent's series	Lecture	Formative Assessment
	3	Zeros of analytic functions – definition and problems	3	To determine zeros of analytic functions	Lecture	Assignment
	4	Singularities – definitions and examples	2	To find singularity of a given function	Lecture	Test
V	1	Residues –definition, lemmas and problems	5	To find residue of a given function	Lecture	Test
	2	Cauchy's residue theorem – theorems and examples	4	To evaluate given definite integrals	Lecture	Test
	3	Evaluation of definite integrals – method and problems	5	To evaluate given definite integrals	Lecture	Formative Assessment

Course Instructor (Aided): Dr. M. K. Angel Jebitha
Mary Course Instructor (S.F): Ms. V. Pincy Kala

HoD (Aided): Dr. V.M. Arul Flower
HoD (Aided): Ms. J. Anne Mary Leema

