B.Sc. MATHEMATICS

PROGRAMME OUTCOMES OF B.SC.

➢ Apply the broaden and in-depth knowledge of science and computing to analyse, think creatively and generate solutions to face the global challenges.

➢ Foster intellectual curiosity, critical thinking and logical reasoning.

➢ Adapt to different roles and responsibilities and develop leadership qualities in multicultural working environment by relating to diversity and ethical practices.

➢ Update the techniques and acquire skills to develop systems and methods to solve current problems.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSOs	Upon completion of B.Sc. Mathematics, the graduates will be able to :
PSO - 1	acquire a strong foundation in various branches of mathematics.
PSO - 2	develop problem solving skills cultivating logical thinking.
PSO - 3	solve problems involving numerical ability and also problems in interdisciplinary areas which would widen the scope of career prospects.
PSO - 4	apply the skills and knowledge gained through the study of mathematics to real life situations and face competitive examinations with confidence.
PSO - 5	pursue higher studies which in turn will offer them job opportunities in government and public sector undertakings, banks, central government institutes etc.

Semester : I **Major Core I**
Name of the Course : Differential Calculus and Trigonometry
Subject code : MC1711

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

Course Outcomes

CO No.	Upon completion of this course, students will be able to	POs/PSOs addressed	CL
CO-1	Recall the idea of derivative, rules of differentiation and understand the concept of p-r equation	PSO-1	R
CO-2	Learn the concepts of curvature, circle of curvature, evolute and apply the concepts to solve problems.	PSO-1 PSO-2, PSO-3	U, Ap
CO-3	Recognize the rules of identifying asymptotes and employ the same to different curves	PSO-2, PSO-3	Ap, U
CO-4	Acquire the knowledge about hyperbolic functions and compare it with circular functions, trigonometric functions ,	PSO-1	U, E

		inverse trigonometric functions and their properties.				
CO-5		Categorize the methods of finding the sum of trigonometric series		PSO-2, PSO-3	An	

Teaching Plan

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

Unit	Module	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/ evaluation
I	**Curvature**					
	1.	Introduction and definition of pedal equation	2	Recall the idea of derivative, rules of differentiation and understand the concept of p-r equation	Lecture	Test
	2.	Problems related to p-r equations	6	Apply the concept of p-r equation in problems	Lecture with illustrations	Group Discussion
	3.	Introduction, definition and theorems based on of curvature	3	To understand the definition of curvature and learn the theorems	Lecture	Test
	4.	Radius of curvature in different forms	2	To understand the definitions of closed sets and limit points with examples and theorems	Lecture	Test
	5.	Problems related to Radius of curvature	2	To identify Hausdorff spaces and practice various theorems	Lecture with illustrations	Group discussion
II	**Centre of curvature, Evolute**					
	1.	Definition and problems based on centre of curvature of the curve	5	To understand the definition of centre of curvature of the curve	Lecture	Test
	2.	Definition and problems related to evolute of the curve	5	To understand the definition of evolute of the curve and practice problems	Lecture	Q&A
	3.	Definition and problems on circle of curvature	5	To practice various problems related to circle of curvature	Lecture	Formative Assessment Test
III	**Asymptotes**					
	1.	Definition and methods of finding asymptotes for the curve y=f(x) and f(x,y)=0	3	To understand the methods of finding asymptotes	Lecture	Quiz
	2.	Working rule to find the inclined asymptotes	2	Recognize the rules of identifying asymptotes	Lecture with illustration	Test
	3.	Problems on linear asymptotes and intersection of curves	5	To apply the rules to different curves	Lecture with group discussion	Brain stoming
	4.	Problems based on inclined asymptotes	5	To apply the rules to different curves	Lecture	Assignment

IV		**Hyperbolic functions, Logarithm of Complex numbers**				
	1.	Introduction and definition of Hyperbolic functions	2	Acquire the knowledge about hyperbolic functions	Lecture with illustration	Quiz
	2.	Problems based on hyperbolic functions	4	To compare with circular functions,	Lecture	Q&A
	3.	Definitions and Problems based on inverse hyperbolic functions	4	Acquire the knowledge about inverse hyperbolic functions	Lecture	Slip Test
	4.	Separate into real and imaginary parts of hyperbolic and inverse hyperbolic functions	5	To distinguish various hyperbolic functions, trigonometric functions , inverse trigonometric functions	Lecture	Formative Assessment Test
V		**Summation of Trigonometric Series**				
	1.	Introduction and Illustrations based on method of difference	4	To analyze the methods of finding the sum of trigonometric series	Lecture with illustration	Quiz
	2.	Theorem and problems on sum of sines and cosines of n angles in A.P	7	To categorize problems on sum of sines and cosines of n angles in A.P	Lecture	Test
	3.	Introduction of C+iS method	1	To know C+iS method	Lecture	Slip Test
	4.	Problems related to C+iS method	3	To apply C+iS method to find the sum of trigonometric series	Lecture	Assignment

Course Instructor(Aided): Dr. K. Jeya Daisy   HOD(Aided) :Dr. V. M. Arul Flower Mary

Course Instructor(S.F): Ms. S. Kavitha   HOD(S.F) :Ms. Anne Mary Leema

Semester   **: I**   **Allied I**
Name of the Course **: Algebra and Calculus (for Physics and Chemistry)**
Subject code   **: MA1711**

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

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Recall the fundamentals of algebraic equations, matrices and rules of integration	PSO-1	R

CO- 2	Practice the formation of equations and compute symmetric functions of roots in terms of coefficients	PSO-1	Ap
CO- 3	Revise the properties of eigen values of the matrices	PSO-2, PSO-3	E
CO -4	Learn Beta, Gamma functions and evaluate integrals using them	PSO-4, PSO-5	E, U
CO- 5	Practice the expansion of Fourier series and utilize the same for higher studies	PSO-2, PSO-3	Ap

Teaching Plan

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

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I	**Theory of equations**					
	1.	Basic definition about Polynomial and its roots. Fundamental Theorem of Algebra and related theorems without proof	3	To recall the fundamentals of algebraic equations, matrices and rules of integration	Lecture	Short Test
	2.	Formation of equations of lowest degree with rational coefficients and solving equations when one root and two roots given.	3	Practice the formation of equations and to solve equations when one root and two roots given.	Lecture and group discussion	Test
	3.	Formation of equation of the lowest degree with rational coefficients whose roots are given	3	Practice the formation of equations and compute symmetric functions of roots in terms of coefficients whose roots are given	Lecture	Test
	4.	Proving that the given equation has no imaginary roots and Relation between roots and coefficients	2	To Prove that the given equation has no imaginary roots and understand the relation between roots and coefficients	Lecture	Test
	5.	Solving equations if their roots are in G.P, A.P	2	To Solve equations if their roots are in G.P, A.P.	Lecture	Test
	6.	Solving equations and finding equal roots two pairs of equal roots, roots which are in some ratio.	2	To Solve equations and finding equal roots, two pairs of equal roots, roots which are in some ratio.	Lecture	Test
II	**Transformation of equations**					
	1	Formation of equation whose roots are k times the roots of f(x) = 0.	3	To understand the transformation of equations and formation of equation whose roots are k times the roots of f(x) = 0.	Lecture and discussion	Test
	2	Form the equation whose	3	To identify the equation	Lecture	Formative

		roots are negative of the roots of the given equation and whose roots are diminished by h		whose roots are negative of the roots of the given equation and whose roots are diminished by h		Assessment
	3	Solve the equation whose roots are equal in magnitude but opposite in sign to the roots of f(x) =0 and to increase the roots of f(x) = 0 by h	3	To identify the equation whose roots are equal in magnitude but opposite in sign to the roots of f(x) =0 and to increase the roots of f(x) = 0 by h	Lecture	Test
	4	Solving the given equation and find the real root using Newton's method.	3	To calculate the given equation and find the real root using Newton's method.	Lecture	Test
	5	Finding positive and negative roots of the equation using Newton's method.	3	To identify positive and negative roots of the equation using Newton's method.	Lecture and discussion	Test
III		**Matrices**				
	1	Basic concepts of matrix addition, matrix multiplication and rank of a matrix and definitions	3	To understand the basic concepts in matrices	Lecture	Test
	2	Test the consistency of the system of given homogenous equations and solving if it is consistent.	2	To solve homogenous equations if it is consistent.	Lecture and discussion	Test
	3	Cayley Hamilton theorem and Solving problems based on Cayley Hamilton theorem	2	To understand Cayley Hamilton theorem solve problems based on it	Lecture	Test
	4	Defining matrix polynomial, Characteristic matrix, Characteristic polynomial and Characteristic equation	2	To identify Characteristic matrix, Characteristic polynomial and Characteristic equation	Lecture	Test
	5	Evaluating the sum and product of the eigen values of the matrix without actually finding the eigen values.	2	To evaluate the sum and product of the eigen values of the matrix without actually finding the eigen values	Lecture	Test
	6	Evaluating Characteristic roots, eigen values and eigen vectors of the matrix.	2	To evaluate Characteristic roots, eigen values and eigen vectors of the matrix.	Lecture	Test
	7	Evaluating the sum and product of the eigen values of the matrix without finding the roots of the	1	To evaluate Characteristic roots, eigen values and eigen vectors of the matrix.	Lecture	Formative Assessment

		characteristic equation.				
	8	Evaluating the characteristic vectors corresponding to each characteristic root of the given matrix.	1	To evaluate Characteristic roots, eigen values and eigen vectors of the matrix.	Lecture	Test
IV		**Beta and Gamma functions**				
	1	Introduction to Beta, Gamma functions, its properties	4	To learn Beta, Gamma functions and its properties.	Lecture and discussion	Test
	2	Evaluation of integrals using Beta Functions	2	To evaluate integrals using Beta Functions	Lecture	Test
	3	Proving duplication formula.	3	To prove duplication formula.	Lecture	Test
	4	Problems based on Beta and Gamma functions.	3	To solve problems based on Beta and Gamma functions.	Lecture	Test
	5	Proving some results on Beta and Gamma functions.	3	To prove some results on Beta and Gamma functions.	Lecture	Test
V		**Fourier Series Expansion**				
	1	Fourier Series Expansion and Fourier coefficients	2	To understand Fourier Series Expansion and Fourier coefficients	Lecture	Test
	2	Explanation of Sine Series and Cosine Series and results based on them	2	To identify Sine Series and Cosine Series and results based on them	Lecture	Test
	3	Evaluate the Fourier Sine series and Fourier Cosine series for the given function.	3	To evaluate the Fourier Sine series and Fourier Cosine series for the given function.	Lecture	Test
	4	Evaluate the Half range Fourier Sine Series and Fourier Cosine Series for the given function.	3	To evaluate the Half range Fourier Sine Series and Fourier Cosine Series for the given function.	Lecture	Test
	5	Evaluate the Fourier series for the given function and deduce certain results.	3	To evaluate the Fourier series for the given function and deduce certain results.	Lecture	Test
	6	Evaluate the Fourier series for the given function in the intervals $(-\pi, \pi)$ and $(0, \pi)$	2	To evaluate the Fourier series for the given function in the intervals $(-\pi, \pi)$ and $(0, \pi)$	Lecture	Formative Assessment

Course Instructors: Ms.Afina Resalaiyan   HOD(Aided) :Dr. V. M. Arul Flower Mary

Semester	: I			NMEC I

Name of the Course : Mathematics for life-I

Subject code : MNM171

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

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO -1	Recall the formation of number system	PSO-1	R
CO -2	Review the rules of operations on numbers	PSO-1	U
CO -3	Differentiate and compare different types of fractions	PSO-2, PSO-3	An
CO -4	Apply BODMAS rule for simplification and determine missing numbers in a sequence	PSO-5	Ap
CO -5	Construct the mathematical simple real life problems and develop solutions	PSO-4, PSO-5	C

Teaching Plan

Total contact hours: 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/evaluation
I	**Numbers**					
	1.	. Introduction of number system, Face value of a digit in a number, Illustrations of a face value	3	To acquire a strong foundation in understanding the number system	Lecture with Illustration	Q & A
	2.	Place value of a digit in a number, Examples of a place value	2	To differentiate between face value and place value of a number	Group discussion	Brainstorming
	3.	Test of divisibility, Examples based on test of divisibility, Applications of Algebraic formulae, Results on Some series	4	To learn short-cut methods to solve problems on divisibility and series	Lecture with Illustration	Slip Test
II	**HCF AND LCM**					
	1.	HCF of numbers, LCM of numbers, Factorization method	3	To learn various rules of operations on numbers	Lecture with PPT	Jigsaw
	2.	Common division method, Examples based on division methods, HCF and LCM of decimal fraction	3	To acquire detailed knowledge on H.C.F. and L.C.M. and its uses in solving problems	Lecture with Illustration	Assignment
	3.	Examples based on	3	To identify the different	Cooperative	Formative

					Learning	Assessment Test
		HCF and LCM of decimal fraction, Comparison of fractions, Examples based on Comparison of fractions		methods to solve the given problem.		
III	**Decimal fraction**					
	1.	Introduction of decimal fraction, Conversion of decimal into vulgar fraction, Examples related to Conversion of decimal into vulgar fraction	4	To differentiate and compare different types of fractions	Lecture and small groups	Quiz
	2.	Operations on decimal fractions	3	To develop problem solving skills cultivating logical thinking.	Lab	Discussion
	3.	Recurring decimal, Mixed recurring decimal	2	To learn techniques to solve problems involving fractions	Lecture and Discussion	Multiple choice questions
IV	**BODMAS rule**					
	1.	Simplification of numbers, BODMAS rule, Examples based on BODMAS rule	4	To apply BODMAS rule for simplification	Lecture and Group Discussion	Quiz
	2.	Modulus of a real number, Examples related to Modulus of a real number	2	To learn to solve problems based on modulus of a real number	Lecture and group discussion	Brainstorming
	3.	Virnaculam (Bar), Illustrations based on Virnaculam, Missing numbers in the given expression	3	To learn about Virnaculam and to determine missing numbers in a sequence	Lecture with Illustration	Test
V	**Square and Cube root**					
	1.	Introduction of square root and cube root, Finding square root by factorization method, Examples based on factorization method, Finding perfect square	4	To construct the mathematical simple real life problems and develop solutions	Lecture and Lab	Slip test
	2.	Finding perfect square, Examples related to perfect square	3	To acquire skills to solve problems involving perfect square	Lecture and small groups	Formative Assessment test
	3.	Finding perfect cube, Examples related to perfect square	2	To study about perfect cube and to solve the problems related to perfect square	Lecture and Jigsaw	Assignment

Course Instructor(Aided): Sr.S.Antin Mary   HOD(Aided) :Dr. V. M. Arul Flower Mary

Course Instructor(S.F): Ms. S. Kavitha   HOD(S.F) :Ms. Anne Mary Leema

Semester : III   **Major Core III**

Name of the course : **Differential Equations and Vector Calculus**

Course Code : **MC1731**

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

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Distinguish linear , nonlinear, ordinary and partial differential equations	PSO-4	An
CO- 2	Solve linear differential equations with constant and variable coefficients	PSO-1	U
CO- 3	Explain the basic properties of Laplace Transform and inverse Laplace Transform	PSO-1	U
CO- 4	Use the Laplace transform in finding the solution of linear differential equations	PSO-2, PSO-3	Ap
CO- 5	Learn methods of forming and solving partial differential equations	PSO-1	U
CO- 6	Learn differentiation and integration of vector valued functions	PSO-1	U
CO- 7	Evaluate line and surface integrals using Green's theorem, Stoke's theorem and Gauss divergence theorem	PSO-4 PSO-5	Ap,E
CO- 8	Apply the concepts to solve problems in physical sciences and engineering	PSO-2 PSO-3	Ap

Teaching Plan

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

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment /Evaluation
I	**Linear Differential equations**					
	1	Introduction of Linear Differential equations with constant coefficients, Formation of auxillary equation and finding the complementary function, Finding the particular integral for e^{ax}	5	Distinguish linear , nonlinear, ordinary and partial differential equations, Solve linear differential equations with constant and variable coefficients	Lecture with illustration	Evaluation through: Short test on finding the particular integral
	2	Finding the particular	3	Solve linear differential	Lecture	Short test on homogeneous linear equations

		integral for cos ax, sin ax, Finding the particular integral for $e^{ax}f(x)$		equations with constant and variable coefficients	with PPT Illustration	
	3	Finding the particular integral for $x^n f(x)$, Introduction of homogeneous linear equations, Conversion of homogeneous linear equations into linear differential equations with constant coefficients	3	Distinguish linear , nonlinear, ordinary and partial differential equations, Solve linear differential equations with constant and variable coefficients	Lecture with illustration	Formative Assessment- I
	4	Solving homogeneous linear equations using the logarithmic substitution , Solving homogeneous linear equations using the new operator	3	Solve linear differential equations with constant and variable coefficients	Lecture with illustration	
II	**Laplace Transform**					
	1	Definition of Laplace Transform, Properties of Laplace Transform, Computation of Laplace Transform of standard functions	3	Explain the basic properties of Laplace Transform and inverse Laplace Transform	Lecture with PPT Illustration	Short test on Computation of Laplace Transform of standard functions
	2	Problems on Laplace Transform, Definition of Inverse Laplace Transform, Properties of Inverse Laplace Transform	5	Explain the basic properties of Laplace Transform and inverse Laplace Transform	Lecture with illustration	
	3	Computation of Inverse Laplace Transform of specific functions, Problems on Inverse Laplace Transform	3	Explain the basic properties of Laplace Transform and inverse Laplace Transform	Lecture with illustration	Assignment on the related problem
	4	Solving Linear Differential equations using Laplace Transform, Solving simultaneous equations using Laplace Transform	4	Use the Laplace transform in finding the solution of linear differential equations	Lecture with illustration	Formative Assessment –II
III	**Partial Differential equations**					
	1	Introduction of Partial differential equations, Formation of Partial differential equations by eliminating the unknown constants, Formation of	4	Learn methods of forming and solving partial differential equations	Lecture with illustration	Short test on formation of Partial differential equations by eliminating the unknown

		Partial differential equations by eliminating the arbitrary functions				constants, and arbitrary function.
	2	Methods of solving Partial differential equations, Standard form of Lagrange's equation, General solution of Lagrange's equation	3	Learn methods of forming and solving partial differential equations	Lecture with PPT Illustration	
	3	Solving Lagrange's equation by method of grouping, Solving Lagrange's equation by method of multipliers	4	Learn methods of forming and solving partial differential equations	Lecture with illustration	Quiz
	4	Solution of Lagrange's equation using grouping and suitable multipliers, Explanation of Charpit's method, Finding the solution of PDE using Charpit's method	4	Learn methods of forming and solving partial differential equations	Lecture Discussion	Formative Assessment-III
IV	**Vector Differentiation**					
	1	Revision of dot and cross product of vectors, Definition and theorems on differentiation of Vectors, Gradient of a scalar function and its properties	4	Learn differentiation and integration of vector valued functions	Lecture with PPT Illustration	Short test on gradient & differentiation of Vectors
	2	Problems based on Gradient, Equation of tangent plane and normal line for a single surface, Equation of tangent line and normal plane for the intersection of two surfaces	4	Learn differentiation and integration of vector valued functions	Lecture with illustration	Formative Assessment-I Short test on Divergence, Curl , Solenoidal and irrotational vectors,
	3	Angle between two surfaces, Divergence of vectors and its properties, Curl of vectors and its properties	3	Learn differentiation and integration of vector valued functions	Lecture with illustration	
	4	Solenoidal and irrotational vectors, Harmonic vectors and Laplace's equation, Problems based on divergence and curl	4	Learn differentiation and integration of vector valued functions	Lecture with illustration	Formative Assessment-II
V	**Vector Integration**					

	1	Definition of line integrals and work done by a force, Parametric equation of curves, Evaluation of line integrals over curves in a plane, Evaluation of line integrals over curves in a surface	4	Evaluate line and surface integrals using Green's theorem, Stoke's theorem and Gauss divergence theorem	Lecture with illustration	Short test on Evaluation of line integrals
	2	Computation of work done by a force, Projection of a surface over a plane, Definition of surface integrals, Evaluation of surface integrals over a plane	4	Evaluate line and surface integrals using Green's theorem, Stoke's theorem and Gauss divergence theorem, Apply the concepts to solve problems in physical sciences and engineering	Lecture with Discussion	Formative Assessment-II
	3	Evaluation of surface integrals over a cube and parrelopiped, Evaluation of surface integrals over a sphere, cylinder and cone, Statement and verification of Green's theorem	4	Evaluate line and surface integrals using Green's theorem, Stoke's theorem and Gauss divergence theorem, Apply the concepts to solve problems in physical sciences and engineering	Lecture with illustration	Short test on Green's theorem& Stoke's theorem
	4	Statement and verification of Stoke's theorem, Statement and verification of Gauss Divergence theorem	4	Evaluate line and surface integrals using Green's theorem, Stoke's theorem and Gauss divergence theorem, Apply the concepts to solve problems in physical sciences and engineering	Lecture with illustration	Short test on Gauss Divergence theorem Formative Assessment-III

Course Instructor (Aided): Dr.V.Sujin Flower   HOD(Aided) :Dr. V. M. Arul Flower Mary Course
Instructor(S.F): V. Mara Narghese   HOD(S.F) :Ms. Anne Mary Leema

Semester   **: III**   **Major Core IV**
Name of the Course   **:Sequences and Series**
Subject code   **: MC1732**

No. of hours per week	Credits	Total No. of hours	Marks
5	4	75	100

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Explain the primary concepts of sequences and series of real numbers	PSO-1	U
CO- 2	Define convergent and divergence of sequences and series	PSO-1	R
CO- 3	Distinguish between convergent and divergent of the sequences and series	PSO-1	U
CO- 4	Relate the behavior of monotonic and geometric sequences and series	PSO-2,PSO-3	Ap
CO- 5	Calculate the limit and peak point of sequences	PSO-4	An
CO- 6	Analyze the importance of Cauchy's general principle of convergence of sequences and series	PSO-4	An
CO- 7	Evaluate the convergence of series using different types of test.	PSO-4	E
CO- 8	Develop their skill in sequence and series to gain mastery in analysis.	PSO-4	An

Teaching Plan

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

Unit	Module	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/evaluation
I		**Sequences**				
	1	Sequences- Definitions Range of Sequences, Limit of a Sequence, Bounded Sequence.	3	Explain the primary concepts of sequences and series of real numbers	Lecture with Illustration	Evaluation through appreciative inquiry
	2	Theorems based on bounded Sequence, Problems based on bounded Sequence, Monotonic Sequence.	3	To distinguish between bounded and monotonic sequences	Lecture with PPT	Evaluation through quizzes and discussions.
	3	Theorems based on Monotonic Sequence Convergent Sequence Theorems based on Convergent Sequence	3	To understand the theorems based on Convergent Sequence and Divergent Sequence	Lecture with Illustration	Slip Test
	4	Divergent Sequence, Oscillating Sequence	3	To understand Divergent Sequence and Oscillating Sequence	Discussion with Illustration	Quiz and Test
II		**Algebra of limits**				

	1	Algebra of limits Theorems based on Algebra of limits, Problems based on Algebra of Limits.	2	To identify the limits And Algebra of limits	Lecture with PPT	Evaluation through discussions.
	2	Null sequence Behaviour of monotonic sequence Theorems based on Behaviour of monotonic sequence	2	To know about Behaviour of monotonic sequence	Lecture	Evaluation through appreciative inquiry
	3	Problems based on Behaviour of monotonic sequences Behaviour of Geometric Sequence	2	To identify Behaviour of monotonic sequences and Behaviour of Geometric Sequence	Lecture	Formative Assessment Test
	4	Theorems based on Behaviour of Geometric Sequence	3	Relate the behavior of monotonic and geometric sequences and series	Group Discussion	Slip Test
	5	Problems based on Behaviour of Geometric sequences	3	To Solve Problems based on Behaviour of Geometric sequences	Group Discussion	Home assignment.
III	**Subsequences**					
	1	Subsequences-Definition Theorems based on Subsequences Subsequences-Examples	2	Explain the primary concepts of Subsequences	Lecture with PPT Illustration	Evaluation through discussions.
	2	Peak points Peak points-Examples Limit points Limit points-Examples	3	Calculate the limit and peak point of sequences	Lecture with Illustration	Evaluation through appreciative inquiry
	3	Cauchy sequences-Definition Cauchy sequences-examples	3	To apply the principles of Cauchy sequences	Lecture	Formative Assessment Test
	4	Theorems based on Cauchy sequences Cauchy's General Principle of Convergence in R.	3	To identify the Cauchy sequences principles and solve problems	Group Discussion	Slip Test
IV	**Series of Positive Terms**					
	1	Series-Definition& Examples Series- Examples	3	Explain the primary concepts of series of real numbers	Lecture with PPT Illustration	Evaluation through discussions.
	2	Theorems based on series Cauchy's General Principle of Convergence in series	3	To understand the theorems based on Cauchy's General Principle of Convergence in series	Lecture and group discussion	Evaluation through Assignment
	3	Comparison Test	3	To know about	Lecture with	Formative

		Alternative form of Comparison Test Theorems based on Comparison Test		Comparison Test Alternative form of Comparison Test Theorems based on Comparison Test	Illustration	Assessment Test
	4	Problems based on Harmonic Series Problems based on Comparison Test	3	To solve the Problems based on Harmonic Series Problems based on Comparison Test	Lecture with Illustration	Slip Test
V	**Test of Convergence of series**					
	1	Test of Convergence of series-Kummer's test Kummer's test Theorem Problems based on Kummer's test	3	Explain the Test of Convergence of series using Kummer's test	Lecture with PPT Illustration	Evaluation through discussions.
	2	D'Alembert's ratio Test Problems based on D'Alembert's ratio Test	3	To understand D'Alembert's ratio Test Problems based on D'Alembert's ratio Test	Lecture with Illustration	Formative Assessment test
	3	Raabe's Test Problems based on Raabe's Test	3	To calculate Problems based on Raabe's Test	Lecture with Illustration	Slip Test
	4	Root Test Problems based on Root Test	2	To differentiate Raabe's Test and Root Test	Lecture with PPT Illustration	Home Assignment
	5	Cauchy's Condensation Test, Problems based on Cauchy's Condensation Test	1	To solve the Problems based on Cauchy's Condensation Test .	Lecture with Illustration	Quiz and Test

Course Instructor (Aided): Ms.J.C.Mahizha   HOD(Aided) :Dr. V. M. Arul Flower Mary Course
Instructor(S.F): Ms. S. Kavitha   HOD(S.F) :Ms. Anne Mary Leema

Semester   **: III**   **Allied III**
Name of the Course   **: Probability Theory and Distributions**
Subject code   **: MA1731**

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

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Recall the definition of probability and set functions	PSO-1	R
CO- 2	Differentiate between probability and conditional probability and compute according to the requirement	PSO-4	An

CO- 3	Understand the definition of random variables, their types and related concepts	PSO-1	U
CO -4	Detect the different probability distributions which are widely used	PSO-4	An
CO- 5	Apply the techniques to prove the properties of probability and related distributions	PSO-2,PSO-3	Ap
CO -6	Choose the suitable probability distribution corresponding to a given data	PSO-4,PSO-5	E
Co-7	Test the validity of a given data	PSO-4,PSO-5	E

Teaching Plan

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

Unit	Module	Topics	Lecture hours	Learning Outcome	Pedagogy	Assessment/ Evaluation
I	**Probability**					
	1	Probability, Experiment, sample space	2	To recall the definition of probability and set functions and understand the definition of random variables, their types and related concepts	Lecture with Illustration	Short Test
	2	Example and Theorems based on Events, Problems based on events and sample space	3	To recall the definition of probability and to apply the techniques to prove the properties of probability and related distributions	Lecture with Illustration	Test
	3	Conditional probability, Problems based on Conditional probability	3	To recall the definition of probability and apply the techniques to prove the properties of probability and related distributions	Lecture with PPT Illustration	Quiz and Test
	4	Properties – Independent events, Theorems based on independent events, Problems based on independent events.	3	To detect the different probability distributions which are widely used and To recall the definition of probability and apply the techniques to prove the properties of probability and related distributions	Lecture with Illustration	Formative Assessment Test
	5	Bayers theorem and Problems based on Bayers theorem	2	To understand the definition of random variables, their types and related concepts	Lecture with Illustration	Test
II	**Random variables**					
	1	Random variables, Distribution function, Discrete, continuous- random variable	3	To recall the definition of probability and set functions, to differentiate between probability and conditional probability and compute according to the	Group Discussion	Quiz and Test

				requirement, and to understand the definition of random variables, their types and related concepts		
	2	Problems based on discrete random variable	2	To recall the definition of probability and set functions	Lecture with Illustration	Test
	3	Problems based on continuous- random variable	2	To detect the different probability distributions which are widely used	Lecture with Illustration	Test
	4	Mathematical expectation	2	Test the validity of a given data	Group Discussion	Quiz and Test
III	**Moment Generating Function**					
	1	Moment Generating Function, Examples of Moment Generating Function, Problems based on Moment Generating Function, Properties of m.g.f	3	Recall the definition of probability and set functions, understand the definition of random variables, their types and related concepts and to apply the techniques to prove the properties of probability and related distributions	Lecture with PPT Illustration	Quiz and Test
	2	Cumulant generating function, properties and Problems based on Cumulant generating Function	3	To recall the definition of probability and set functions and to apply the techniques to prove the properties of probability and related distributions	Group Discussion	Short Test
	3	Characteristic function ,properties, Problems based on Characteristic function and Poisson distribution	3	To recall the definition of probability and set functions, to detect the different probability distributions which are widely used and to apply the techniques to prove the properties of probability and related distributions	Lecture with Illustration	Test
	4	Theorem based on poission distribution, Problems based on poission distribution, Mode,mgf of poission distribution	3	To recall the definition of probability and set functions and to apply the techniques to prove the properties of probability and related distributions and to understand the definition of random variables, their types and related concepts	Group Discussion	Short Test
	5	Theorems based on	3	To apply the techniques to	Lecture with	Test

		Mode,mgf of poisson distribution, fitting of poission distribution and problems based on this		prove the properties of probability and related distributions and to detect the different probability distributions which are widely used	Illustration	
IV	**Binomial Distribution**					
	1	Introduction-Definition, Moments of binomial Distribution	3	To recall the definition of probability and set functions and to understand the definition of random variables, their types and related concepts	Group Discussion	Short Test
	2	Central moments, Theorems based on Central moments	3	To understand the definition of random variables, their types and related concepts and recall the definition of probability and set functions	Lecture with Illustration	Test
	3	Mode of binomial distribution, Problems based on Mode of binomial distribution	3	To recall the definition of probability and set functions and to apply the techniques to prove the properties of probability and related distributions	Group Discussion	Short Test
	4	Fitting of binomial distribution, examples, Problems based on fitting of binomial distribution	3	To detect the different probability distributions which are widely used and to apply the techniques to prove the properties of probability and related distributions	Lecture with Illustration	Test
V	**Normal Distribution**					
	1	Definition , m .g. f about origin of normal distribution , Mean and variance	3	To recall the definition of probability and set functions and to apply the techniques to prove the properties of probability and related distributions	Lecture with Illustration	Test
	2	Standard normal variate , mode, Median ,m.g.f about mean of normal distribution, Theorems based on mean of normal distribution	3	To recall the definition of probability and set functions and to understand the definition of random variables, their types and related concepts	Lecture with Illustration	Quiz and Test
	3	Problems based on mean of normal	3	To recall the definition of probability and set	Lecture with Illustration	Formative Assessment

		distribution, Area property of normal distribution, Problems based on area of normal distribution		functions and to understand the definition of random variables, their types and related concepts and to apply the techniques to prove the properties of probability and related distributions		Test
	4	Quartile deviation for the normal distribution, Fitting of normal distribution, Problems based on Fitting of normal distribution	3	To recall the definition of probability and to detect the different probability distributions which are widely used and to apply the techniques to prove the properties of probability and related distributions	Lecture with Illustration	Test

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