

Department of Mathematics

Semester : II Major Core II
 Name of the Course : Classical Algebra and Integral Calculus
 Subject code : MC1721

Teaching Plan

Unit	Modules	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, irrational roots occur in pairs Relations between roots and coefficients of equations	3	To distinguish between imaginary roots occur in pairs and irrational roots occur in pairs	Lecture	Evaluation through quizzes and discussions.
	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	4	To identify the	Lecture	Evaluation

		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		Reciprocal equations Standard form of reciprocal equations	with Examples	through discussions.
	2	Any reciprocal equation can be reduced to a Standard reciprocal equation Solving different types of reciprocal equations Increasing or decreasing the roots of a given equation by a given quantity	4	To solve different types of reciprocal equations	Lecture	Evaluation through appreciative inquiry
	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	4	To apply the double	Lecture	Formative

		integrals over a specified region bounded by different curves Working rule for changing the order of integration Problems on changing the order of integration		integrals over a specified region bounded by different curves		Assessment Test
	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 Fourier series over an interval of	4	To understand Fourier series expansion and	Lecture with	Formative Assessment

		length 2π Deduction of sum of series from Fourier series expansion Introduction of half range Fourier series expansion		half range Fourier series expansion	Illustration	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

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

HOD(Aided) :Dr. V. M. Arul Flower Mary
HOD(S.F) :Ms. Anne Mary Leema

Semester : II
Name of the Course : Vector Calculus and Differential Equations (for Physics and Chemistry)
Subject code : MA1721

Allied II

Teaching Plan

Unit	Modules	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 tangent	4	To understand the tangent plane and normal line and its	Lecture, Small groups	Test

		line and normal plane for the intersection of two surfaces, Angle between two surfaces		various functions		
	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 auxiliary 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	3	To understand the basics and the formation of partial	Lecture with Illustration	Quiz

		differential equations by eliminating the unknown constants,		differential equations		
	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 of grouping	3	To use computational tool to solve problems and applications of partial differential equation of first order	Lecture and Discussion	Brain storming
	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

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& Ms. J.C. Mahizha

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

Semester : II
 Name of the Course : Mathematics for life – II (NMEC)
 Subject code : MNM172

NMEC II

Teaching Plan

Unit	Modules	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/evaluation
I	Average					
	1.	Average: Formula & Problems, related to Average of prime, natural and consecutive even and odd integers	3	To find the average of different kinds of numbers	Lecture	Test
	2.	Speed: Formula & Problems, related to distance and speed	3	To solve problems related to distance and speed	Lecture	Test
	3.	Real life problems related to average and speed	3	To apply average in real life problems	Group discussion	Quiz
II	Problems on Numbers					
	1.	Framing and solving equations involving unknown numbers	2	To frame and solve equations	Lecture	Test
	2.	Framing and solving equations involving sum average and squares	2	To frame and solve equations involving sum average and squares	Group discussion	Quiz
	3.	Problems involving ratios and fractions	2	To solve problems involving ratios and fractions	Lecture	Formative Assessment Test
	4.	Problems involving interchanging the digits of a number, reciprocal of a number	3	To apply the concept in real life problems	Lecture	Test
III	Problems on Ages					
	1.	Problems based on the difference between the ages of two persons	2	To employ the problems related to ages and apply the same to real life situations	Lecture	Test
	2.	Problems based on the ages of father and son	2	To employ the problems related to ages and apply the same to real life situations	Lecture	Test
	3.	Comparison on ages of two persons	2	To analyse the problems related to comparison of ages	Group discussion	Quiz
	4.	Problems based on	3	To find the ratio of ages	Lecture	Formative

		the Ratio of ages.				Assessment Test
IV	Surds and Indices					
	1.	Surds and Indices: Formula & direct problems	2	To solve problems related to Surds and Indices	Lecture	Test
	2.	Finding largest surds and application of laws of indices and surds	3	To apply law of indices and surds to find missing numbers in an expression	Lecture	Test
	3.	Comparison of surds	2	To compare surds and ratio	Group discussion	Quiz
	4.	Finding surds in larger expressions	2	To find surds in larger expressions	Lecture	Test
V	Ratio and proportion					
	1.	Formulae for ratio and proportion and Problems based on Fourth, third and mean proportional	3	To learn ratio and proportion and practice duplication and triplication of ratios	Lecture	Quiz
	2.	Problems based on comparison of ratios and compounded ratios	2	To compare ratios and compounded ratios	Lecture	Formative Assessment Test
	3.	Problems based on proportion	2	To solve problems related to proportion	Lecture	Assignment
	4.	Problems based on Variation	2	To solve problems related to variation	Lecture	Assignment

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Semester : IV
 Name of the Course : Groups and Rings
 Subject code : MC1741

Major Core V

Teaching Plan

Unit	Modules	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 Skew fields and Theorems based on Skew fields	2	To apply Skew fields 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 sub rings	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	Lecture	Assignment

				Homomorphism of Rings	with Illustration	
	7.	Unique factorization Domain	2	To understand and analyze about Unique factorization Domain	Lecture with Illustration	Quiz and Test

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Semester

: IV

Major Core VI

Name of the Course

: Analytical Geometry - 3 Dimensions

Subject code

: MC1742

Teaching Plan

Unit	Modules	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 direction ratios and projection of the line joining two points.	3	To analyze the equations of two skew lines in a simplified form	Lecture	Test
	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	3	To practice various problems related to	Lecture	Formative Assessment

		of intersection of two given planes		plane through the line of intersection of two given planes		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 equation of a line in different forms	3	To understand the methods of finding equation of a line in different forms	Lecture	Quiz
	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	Shortest distance between two lines					
	1.	Introduction and definition of Shortest distance between two lines	2	To understand the Shortest distance between two lines	Lecture with illustration	Quiz
	2.	Problems based on The equations of two skew lines in a simplified form	4	To analyze the equations of two skew lines in a simplified form	Lecture	Q&A
	3.	Definitions and Problems based on Intersection of three planes	3	Acquire the knowledge about Intersection of three planes	Lecture	Slip Test
	4.	Theorem and problems based on volume of a tetrahedron.	3	To practice various problems related to volume of a tetrahedron	Lecture	Formative Assessment Test
V	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 with illustration	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	2	To know The length of the	Lecture	Slip Test

		tangent from the point to the sphere		tangent from the point to the sphere		
	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

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Semester

: IV

Allied

Name of the Course

: Applied Statistics

Subject code

: MA1741

Teaching Plan

Unit	Modules	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 correlation coefficient for the given data	3	To analyze Rank correlation and to solve the problems.	Lecture	Assignment
	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	3	To testing of hypothesis	Lecture	Quiz

		errors in testing of hypothesis, critical values for different levels of significance, Procedure for testing of a statistical hypothesis				
	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 known, Problems based on confidence limits for population mean, Problems based on test of significance of means.	4	To Learn some methods to solve the Problems based on confidence limits for population mean and Problems based on test of significance of means.	Lecture	Test
	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	2	To solve problems	Lecture	Assignment

		the means of two samples, Confidence limits for population mean		related Confidence limits		
	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

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