STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI
COURSE PLAN June - November 2024

Department : Mathematics
Name/s of the Faculty : Dr. S. Sarah Surya
Course Title : Mathematics for Chemistry-I
Course Code : 23MT/AC/MC15
Shift : I

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	Recall the fundamental concepts of matrices, algebra, calculus, partial differential equations and finite difference methods	K1
CO2	Understand different techniques in obtaining approximate solutions to complex mathematical problems, solving algebraic problems and to employ the various techniques in finding derivatives and integration	K2
CO3	Solve the results of calculus through illustrations, equations, and to utilize several methods in interpolation, differentiation and integration	K3
CO4	Analyse solutions that are obtained by using techniques of calculus, algebra and finite differences and to classify partial differential equations and obtain their solutions systematically	K4
CO5	Evaluate the eigen vectors, integrals and to predict appropriate methods to find the solution of problems on differential and interpret results using appropriate numerical techniques	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Jun 24 – 26, 2024 (Day Order 4 - 6)	1	**Properties of Matrices** 1.1 Eigenvalues and Eigenvector	K1- K5	2	CO1-5	Lecture Solving problems	Questioning
Jun 27 – July 4, 2024 (Day Order 1 - 6)	1	**Properties of Matrices** 1.2 Cayley Hamilton Theorem (statement only) 1.3 Diagonalization of Matrices possessing Distinct Eigenvalues	K1- K5	5	CO1-5	Lecture Solving problems Learning by Doing	Questioning
July 5 – 12, 2024 (Day Order 1 - 6)	1	**Properties of Matrices** 1.3 Diagonalization of Matrices possessing Distinct Eigenvalues 1.4 Eigenvalues for symmetric matrices	K1- K5	5	CO1-5	Lecture Solving problems	**Third Component I** Assignment **Marks:** 20
July 15 – 23, 2024 (Day Order 1 - 6)	2	**Theory of Equations** 2.1 Relation Between Roots and Coefficients 2.2 Solution of Equations under given Conditions On Roots	K1- K5	5	CO1-5	Lecture Solving problems Group discussions	Questioning
July 24 – 31, 2024 (Day Order 1 - 6)	2	**Theory of Equations** 2.3 Transformation of Equations 2.4 Reciprocal Equations	K1- K5	5	CO1-5	Lecture Solving problems	Quiz

Aug 1 – 5, 2024 (Day Order 1 - 3)	2	**Theory of Equations** 2.4 Reciprocal Equations	K1- K5	3	CO1-5	Lecture Solving problems Learning by Doing	Questioning
Aug 6 – 10, 2024	**C.A. Test – I (Units 1 & 2)**						
Aug 12 – 14, 2024 (Day Order 4-6)	3	**Differential Calculus** 3.1 Differentiation of Hyperbolic and Inverse Hyperbolic Functions	K1- K5	2	CO1-5	Lecture Solving problems Learning by Doing	Quiz
Aug 16 – 23, 2024 (Day Order 1-6)	3	**Differential Calculus** 3.2 Higher Derivatives - n^{th} derivative – Standard Results 3.3 n^{th} derivative of algebraic and rational functions of the form $\frac{f(x)}{\varphi(x)}$	K1- K5	5	CO1-5	Lecture Solving problems Group discussions	Slip test

Date		Topic				Method	Assessment
Aug 27 – Sep 3, 2024 (Day Order 1-6)	3	3.4 Trigonometric Transformations **Integral Calculus** 3.5 Methods of Integration of functions of the Following Types: $\dfrac{1}{(x+p)\sqrt{ax^2+bx+c}}$; $\sqrt{(x-a)(b-x)}$; $\dfrac{1}{\sqrt{(x-a)(b-x)}}$; $\sqrt{\dfrac{(x-a)}{(b-x)}}$	K1- K5	5	CO1-5	Lecture Solving problems Learning by Doing	Slip test
Sep 4 – 11, 2024 (Day Order 1-6)	3	**Integral Calculus** 3.5 Methods of Integration of functions of the Following Types: $\dfrac{1}{(x+p)\sqrt{ax^2+bx+c}}$; $\sqrt{(x-a)(b-x)}$; $\dfrac{1}{\sqrt{(x-a)(b-x)}}$; $\sqrt{\dfrac{(x-a)}{(b-x)}}$	K1- K5	5	CO1-5	Lecture Solving problems Group discussions	**Third Component II** Problem solving **Marks:** 20
	4	**Partial Differential Equations** 4.1 Formation of Equations by Elimination of Constants and an Arbitrary Function (Problems only)					

Sep 12 - 20, 2024 (Day Order 1-6)	4	**Partial Differential Equations** 4.2 Definition of General, Particular, Complete and Singular Integral 4.3 Solutions of First Order Equations in their Standard Forms	K1- K5	5	CO1-5	Lecture Solving problems	Questioning
Sep 23 - 26, 2024 (Day Order 1-4)		**Partial Differential Equations** 4.3 Solutions of First Order Equations in their Standard Forms 4.4 Lagrange's Method of Solving of Linear Equations $Pp + Qq = R$	K1- K5	4	CO1-5	Lecture Solving problems	Slip test
Sep 27 – Oct 3, 2024	**C.A. Test – II (Unit 3 & part of 4)**						
Oct 4 – 5, 2024 (Day 5 & 6)	4	**Partial Differential Equations** 4.4 Lagrange's Method of Solving of Linear Equations $Pp + Qq = R$	K1- K5	1	CO1-5	Lecture Solving problems	Third Component III Quiz **Marks:** 10
	5	**Finite Difference Methods** 5.1 Finite Differences 5.2 Forward Difference Table					

Oct 7 - 15, 2024 (Day Order 1 to 6)	5	**Finite Difference Methods** 5.3 Interpolation Methods 5.4 Newton's Forward Formula 5.5 Newton's Backward Formula	K1- K5	5	CO1-5	Lecture Solving problems Group discussions	Questioning
Oct 16 - 22, 2024 (Day Order 1 to 6)	5	**Finite Difference Methods** 5.6 Binomial Method 5.7 Lagrange's Formula	K1- K5	5	CO1-5	Lecture Solving problems Learning by Doing	Slip test
Oct 23 - 24, 2024 (Day Order 1 to 2)	**REVISION**						