STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (November 2024 – April 2025)

Department : **Mathematics**

Name/s of the Faculty : **Dr. S. Sarah Surya (3 hours) and Dr. Sindiya Therese S (2 hours)**

Course Title : **Mathematics for Chemistry-II**

Course Code : **23MT/AC/MC25**

Shift : **I**

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	recall basic mathematical concepts required for students pursuing Chemistry	K1
CO2	understand mathematical tools like Laplace transforms, Inverse Laplace transforms, Fourier series, Statistics to compute simple problems	K2
CO3	apply various techniques like Laplace transforms, inverse Laplace transforms, Fourier series, Statistics and Group theory to real life situations applicable in Chemistry	K3
CO4	analyse to use the appropriate tools in Chemistry	K4
CO5	evaluate the techniques learnt and to solve problems in real life situation	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods

Nov 18 – 25, 2024 (Day Order 1-6)	1 & 3	**Unit 1: Laplace Transform** 1.1 Definition of Laplace transform 1.2 Transforms of $f'(t)$ & $f''(t)$ **Unit 3: Fourier Series** 3.1 Fourier Series: Definition	K1- K5	3+2	CO1-5	Lecturing and Problem solving Group Discussions	Slip Test
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1 & 3	**Unit 1: Laplace Transform** 1.2 Transforms of $f'(t)$ & $f''(t)$ 1.3 Transformation of Function e^{-at}, cos at, sin at and t^n, where 'n' is a Positive Integer **Unit 3: Fourier Series** 3.2 Finding Fourier Coefficients for a given Periodic Function with Period 2π	K1- K5	3+2	CO1-5	Lecturing and Problem solving Group Discussions	Quiz
Dec 4-11, 2024 (Day Order 1 to 6)	1 & 3	**Unit 1: Laplace Transform** 1.3 Transformation of Function e^{-at}, cos at, sin at and t^n, where 'n' is a Positive Integer 1.4 First Shifting Theorem: Laplace Transforms of $e^{-at}\cos bt$, $e^{-at}\sin bt$ and $e^{-at}t^n$ **Unit 3: Fourier Series** 3.2 Finding Fourier Coefficients for a given Periodic Function with Period 2π	K1- K5	3+2	CO1-5	Presentation Group Discussions	**Third Component Test for 20 marks (Problem Test – Unit 1)**
Dec 12-19, 2024 (Day Order 1 to 6)	1 & 3	**Unit 1: Laplace Transform** 1.4 First Shifting Theorem: Laplace Transforms of $e^{-at}\cos bt$, $e^{-at}\sin bt$ and $e^{-at}t^n$ **Unit 3: Fourier Series** 3.3 Odd and Even Functions	K1- K5	3+2	CO1-5	Lecturing and Problem solving Group Discussions	Quiz
Dec 20, 2024	2	**Unit 2: Inverse Laplace Transform** 2.1 Inverse Laplace Transforms of Functions	K1- K5	1+0	CO1-5	Lecturing and	Quiz

(Day Order 1)		relating to $e^{-at}\cos bt$, $e^{-at}\sin bt$ and $e^{-at}t^n$				Problem solving	
Jan 3 – 7, 2025 (Day Order 3 to 6)	2 & 3	**Unit 2: Inverse Laplace Transform** 2.1 Inverse Laplace Transforms of Functions relating to $e^{-at}\cos bt$, $e^{-at}\sin bt$ and $e^{-at}t^n$ **Unit 3: Fourier Series** 3.4 Half-range Fourier Series-Development in Cosine Series, Development in Sine Series	K1- K5	2+2	CO1-5	Lecturing and Problem solving Group Discussions	Quiz
Jan 8 – 17, 2024 (Day Order 1 to 6)	2 & 3	**Unit 2: Inverse Laplace Transform** 2.1 Inverse Laplace Transforms of Functions relating to $e^{-at}\cos bt$, $e^{-at}\sin bt$ and $e^{-at}t^n$ **Unit 3: Fourier Series** 3.4 Half-range Fourier Series-Development in Cosine Series, Development in Sine Series	K1- K5	3+2	CO1-5	Lecturing and Problem solving Group Discussions	Slip Test
Jan 18 - 23, 2025	**C.A. Test – I (Unit 2 & 3)**						
Jan 24 -31, 2025 (Day Order 1 to 6)	2 & 4	**Unit 2: Inverse Laplace Transform** 2.2 Applications to Solutions of Ordinary Differential Equations with Constant Coefficients **Unit 4: Statistics** 4.1 Correlation 4.2 Scatter Diagram and its Uses	K1- K5	3+2	CO1-5	Lecturing and Problem solving Case Analysis	Slip Test
Feb 3-8, 2025 (Day Order 1 to 6)	2 & 4	**Unit 2: Inverse Laplace Transform** 2.2 Applications to Solutions of Ordinary Differential Equations with Constant Coefficients **Unit 4: Statistics** 4.3 Karl Pearson's Coefficient of Correlation	K1- K5	3+2	CO1-5	Lecturing and Problem solving Case Analysis	Slip Test

Feb 10– 18, 2025 (Day Order 1 to 4)	5 & 4	**Unit 5: Group Theory** 5.1 Groups–Definitions and Examples **Unit 4: Statistics** 4.4 Regression	K1- K5	2+1	CO1-5	Lecturing and Problem solving Case Analysis	**Third Component for 10 marks (Seminar– Unit 5)**
Feb 19- 26, 2025 (Day Order 1-6)	5 & 4	**Unit 5: Group Theory** 5.2 Properties of a Group **Unit 4: Statistics** 4.4 Regression	K1- K5	3+2	CO1-5	Group discussion Problem Solving Case Analysis	Quiz
Feb 27- Mar 6, 2025 (Day Order 1 to 6)	5 & 4	**Unit 5: Group Theory** 5.3 Order of an Element 5.4 Subgroups **Unit 4: Statistics** 4.5 Definition and Uses 4.6 Difference between Regression and Correlation	K1- K5	3+2	CO1-5	Lecturing and Problem solving Case Analysis	**Third Component Case Studies for 20 marks (Unit 4)**
Mar 7 – 11, 2025 (Day Order 1 to 3)	5 & 4	**Unit 5: Group Theory** 5.4 Subgroups **Unit 4: Statistics** 4.7 Graphic Method	K1- K5	1+1	CO1-5	Lecturing and Problem solving Case Analysis	Slip test
Mar 12 –17, 2025	**C.A. Test – II (Unit 4 & 5)**						

Mar 18 – 20, 2025 (Day 4 to 6)	5 & 4	**Unit 5: Group Theory** 5.5 Permutation Groups **Unit 4: Statistics** 4.8 Regression Equations: Regression Equation of Y on X and X on Y	K1- K5	2+1	CO1-5	Lecturing and Problem solving Case Analysis	Slip Test
Mar 21 - 28, 2025 (Day Order 1 to 6)	5 & 4	**Unit 5: Group Theory** 5.6 Cyclic Groups **Unit 4: Statistics** 4.8 Regression Equations: Regression Equation of Y on X and X on Y	K1- K5	3+2	CO1-5	Lecturing and Problem solving Case Analysis	Slip Test
Mar 29- April 2, 2025 (Day Order 1 to 3)	**REVISION**						

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