

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (November 2024 – April 2025)

Department : Mathematics
Name/s of the Faculty : S Mercy Soruparani
Course Title : Complex Analysis
Course Code : 23MT/PC/CA44
Shift : I

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	define functions of complex variables	K1
CO2	understand the behaviour of complex functions in certain region through different techniques	K2
CO3	apply complex integration to analytic functions	K3
CO4	analyse mappings on simply connected region	K4
CO5	assess explicit analytic expressions	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Nov 18 – 25, 2024 (Day Order 1-6)	1 1.1	Complex Integration Fundamental Theorems: Line	K1-K5	5	CO1-CO5	Lecture	Quiz

	1.2	Integrals as Functions of Arcs Cauchy's Theorem for a Rectangle					
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1.3 1.4 1.5	Cauchy's Theorem in a Disk Cauchy's Integral Formula: The Index of a Point with respect to a Closed Curve The Integral Formula	K1-K5	5	CO1-CO5	Problem Solving	Questioning
Dec 4-11, 2024 (Day Order 1 to 6)	1.6 2.1 2.2 2.3	General Form of Cauchy's Theorem: Chains and Cycles Complex Integration (cont.) Simple Connectivity Homology General Statement of Cauchy's Theorem	K1-K5	5	CO1-CO5	Presentation	Problem Solving
Dec 12-19, 2024 (Day Order 1 to 6)	2.4 2.5 2.6	Proof of Cauchy's Theorem Harmonic Functions: Definition and Basic Properties The Mean Value Property	K1-K5	5	CO1-CO5	Lecture	Group Discussion
Dec 20, 2024 (Day Order 1)	2.7 2.8	Poisson's Formula Schwarz's Theorem	K1-K5	1	CO1-CO5	Problem Solving	Questioning
Jan 3 – 7, 2025 (Day Order 3 to 6)	2.9	The Reflection Principle	K1-K5	3	CO1-CO5	Presentation	Problem Solving

Jan 8 – 17, 2024 (Day Order 1 to 6)	3 3.1 3.2	Series and Product Development Partial Fractions and Factorization: Partial Fractions Infinite Products	K1-K5	5	CO1-CO5	Lecture	Quiz
Jan 18 - 23, 2025	C.A. Test – I Units 1 & 2						
Jan 24 -31, 2025 (Day Order 1 to 6)	3.3 3.4 3.5	Canonical Products Gamma Function Entire Functions: Jensen's Formula	K1-K5	5	CO1-CO5	Lecture	Presentation
Feb 3-8, 2025 (Day Order 1 to 6)	3.6 3.7 3.8	The Riemann Zeta Function: The Product Development Extension of $\zeta(z)$ to the Whole Plane The Functional Equation	K1-K5	5	CO1-CO5	Problem Solving	presentation
Feb 10– 18, 2025 (Day Order 1 to 4)	3.9	The Zeros of the Zeta Function	K1-K5	3	CO1-CO5	Lecture	Problem Solving
Feb 19- 26, 2025 (Day Order 1-6)	4 4.1 4.2 4.3	Series and Product Development (contd.) Normal Families: Equicontinuity Normality and Compactness Arzela's Theorem	K1-K5	5	CO1-CO5	Problem Solving	Questioning
Feb 27- Mar 6, 2025	4.4	Families of Analytic Functions	K1-K5	5	CO1-CO5	Lecture	Quiz

(Day Order 1 to 6)	4.5	The Riemann Mapping Theorem: Statement and Proof					
Mar 7 – 11, 2025 (Day Order 1 to 3)	5 5.1 5.2	Conformal mapping Boundary Behavior Use of the Reflection Principle	K1-K5	2	CO1-CO5	Lecture	Presentation
Mar 12 –17, 2025	C.A. Test – II Units 3 & 4						
Mar 18 – 20, 2025 (Day 4 to 6)	5.3 5.4 5.5	Analytic Arcs Conformal Mapping of Polygons: The Behaviour at an Angle The Schwarz Christoffel Formula	K1-K5	3	CO1-CO5	Presentation	Test: 30 Marks
Mar 21 - 28, 2025 (Day Order 1 to 6)	5.6 5.7	Application to Fluid Dynamics: Fluid Flow in a Channel through a Slit Application to Fluid Dynamics: Flow in a Channel with an Offset	K1-K5	5	CO1-CO5	Presentation	Seminar: 20 Marks
Mar 29- April 2, 2025 (Day Order 1 to 3)	REVISION						