STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: November 2024 – April 2025

Department : Mathematics

Name/s of the Faculty : Dr. P. Subbulakshmi

Course Title : Principles of Complex Analysis

Course Code : 19MT/MC/CA65

Shift : II

Week & No. of	Units & Topics	Teaching Mathadalagy	Text & References	Method of
hours Nov 18 – 25, 2024 (Day Order 1-6) (6 hours)	Unit 1: Analytic Functions 1.1 Functions of a complex variable 1.2 Continuity 1.3 Derivatives 1.4 Cauchy-Riemann Equations	Methodology Lecturing Problem Solving	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018. Karunakaran, V, Desai A.R, Complex analysis, New Delhi: Narosa, New Delhi, 2005.	Evaluation Questioning
Nov 26- Dec 3, 2024 (Day Order 1 to 6) (6 hours)	Unit 1: Analytic Functions 1.5 Sufficient Conditions for Differentiability 1.6 Polar Coordinates 1.7 Analytic Functions 1.8 Harmonic Functions	Lecturing Flipped Classroom	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018. Arumugam S., A.T. Issac, and A. Somasundaram. Complex Analysis. Chennai: Scitech, 2001, Reprint 2019.	Questioning Slip Test
Dec 4-11, 2024 (Day Order 1 to 6) (6 hours)	Unit 1: Analytic Functions 1.9 Harmonic conjugates Unit 2: Elementary Functions 2.1 The Exponential Function	Lecturing Problem Solving	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018.	Questioning
Dec 12-19, 2024 (Day Order 1 to 6) (6 hours)	Unit 2: Elementary Functions 2.2 The Logarithmic Function 2.3 Branches and Derivatives of Logarithms	Lecturing Problem Solving	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018. Karunakaran, V, Desai A.R, Complex analysis, New Delhi: Narosa, New Delhi, 2005.	Questioning

Dec 20, 2024 (Day Order 1)	Unit 2: Mapping by	Lecturing	Brown J.W. and R.V. Churchill.	MCQ Test
(1 hour)	Elementary Functions	Problem	Complex Variables and Applications. New York: McGraw	[15 marks]
	2.4 Linear Transformations	Solving	Hill Education, International Edition 1990, Eleventh reprint 2018.	(Unit 1)
Jan 3 – 7, 2025 (Day Order 3 to 6) (4 hours)	Unit 2: Mapping by Elementary Functions 2.5 The Transformation $w = 1/z$ 2.6 Linear Fractional Transformations 2.7 An Implicit Form	Lecturing Video Presentations	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018.	Questioning Slip Test
Jan 8 – 17, 2024 (Day Order 1 to 6) (6 hours)	Unit 2: Mapping by Elementary Functions 2.8 Mappings of the Upper Half Plane 2.9 The Transformation w = sin z Unit 3: Integrals 3.1 Cauchy-Goursat Theorem 3.2 Simply connected Domains	Lecturing Demonstrations	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018. Karunakaran, V, Desai A.R, Complex analysis, New Delhi: Narosa, New Delhi, 2005.	Questioning
Jan 18 - 23, 2025	C.A. Test – I (Units 1 and 2)			
Jan 24 - 30, 2025	Unit 3: Integrals		(mar.
(Day Order 1 to 6)	3.3 Multiply Connected Domains	Lecturing	Brown J.W. and R.V. Churchill. Complex Variables and	Third Component Test
(6 hours)	3.4 Cauchy Integral Formula 3.5 An Extension of the Cauchy Integral Formula	Flipped Classroom	Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018.	[15 marks] (Unit 3 – Sections 3.1, 3.2)
Feb 3-8, 2025	Unit 3: Integrals			
(Day Order 1 to	3.6 Some			
6) (6 hours)	Consequences of the Extension	Lecturing	Brown J.W. and R.V. Churchill. Complex Variables and	Quartianina
	3.7 Liouville's Theorem and the Fundamental Theorem of Algebra 3.8 Maximum Modulus Principle	Problem Solving	Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018.	Questioning

Est 10 10 2025	Unit 4: Conformal		Brown J.W. and R.V. Churchill.	
Feb 10– 18, 2025		Lecturing	Complex Variables and	
(Day Order 1 to	Mapping 4.1 Preservation of		Applications. New York: McGraw	Questioning
4)	Angles	Demonstrations	Hill Education, International	Questioning
(4 hours)	4.2 Scale Factors	Demonstrations	Edition 1990, Eleventh reprint	
	4.2 Scale Factors		2018.	
Feb 19- 26, 2025	Unit 4: Applications		Brown J.W. and R.V. Churchill.	
,	of Conformal		Complex Variables and	
(Day Order 1-6)	Mapping	Lecturing	Applications. New York: McGraw	
(6 hours)	4.3 Two-dimensional	Lecturing	Hill Education, International	
	Fluid Flow	Dualdana	Edition 1990, Eleventh reprint	Overtioning
	4.4 The Stream	Problem	2018.	Questioning
	Function	Solving	2010.	
	4.5 Flows Around a	_	Karunakaran, V, Desai A.R,	
	Corner and Around a		Complex analysis, New Delhi:	
	Cylinder		Narosa, New Delhi, 2005.	
Feb 27- Mar 6,	Unit 4: Series	Lecturing	Brown J.W. and R.V. Churchill.	
2025	4.6 Taylor Series		Complex Variables and	
(Day Order 1 to	4.7 Laurent Series	Problem	Applications. New York: McGraw	Slip Test
` •			Hill Education, International	Shp Test
6)		Solving	Edition 1990, Eleventh reprint	
(6 hours)			2018.	
Mar 7 – 11, 2025	Unit 5:	Lasturina	Brown J.W. and R.V. Churchill.	
(Day Order 1 to	Residues and Poles	Lecturing	Complex Variables and	
3)	5.1 Isolated Singular		Applications. New York: McGraw	
(3 hours)	Points	Video	Hill Education, International	Questioning
(5 hours)	5.2 Residues	Presentations	Edition 1990, Eleventh reprint	
	5.3 Cauchy's Residue		2018.	
	Theorem			
Mar 12 –17, 2025	C.A	A. Test – II (Unit 3	3 – Sections 3.3 to 3.8, Unit 4)	
Mar 18 – 20, 2025			Brown J.W. and R.V. Churchill.	
(Day 4 to 6)			Complex Variables and	
(3 hours)	Unit 5:	Lecturing	Applications. New York: McGraw	
	Residues and Poles		Hill Education, International	
	5.4 Residue at Infinity	Problem	Edition 1990, Eleventh reprint	Questioning
	5.5 The Three Types		2018.	
	of Isolated Singular	Solving		
	Points		Karunakaran, V, Desai A.R,	
			Complex analysis, New Delhi:	
M 01 00 0007			Narosa, New Delhi, 2005.	
Mar 21 - 28, 2025	Unit 5:		Brown J.W. and R.V. Churchill.	Third
(Day Order 1 to 6)	Residues and Poles		Complex Variables and	Component
(6 hours)	5.6 Residues at Poles	Lecturing	Applications. New York: McGraw	Test
	5.7 Zeros of Analytic		Hill Education, International	
	Functions	Problem	Edition 1990, Eleventh reprint	[20 marks]
	5.8 Zeros and Poles		2018.	
	Applications of	Solving	Arumugam S., A.T. Issac, and A.	(Unit 5 –
	Residues		Somasundaram. Complex	Sections 5.1
	5.9 Evaluation of		Analysis. Chennai: Scitech, 2001	to 5.5)
	Improper Integrals		Reprint 2019.	,
	<u> </u>		Κοριίπ 2017.	l

Mar 29- April 3, 2025 (Day Order 1 to 3) (3 hours)	Unit 5: Applications of Residues 5.10 Definite Integrals Involving Sines and Cosines 5.11 Argument Principle 5.12 Rouche's Theorem	Lecturing Problem Solving	Brown J.W. and R.V. Churchill. Complex Variables and Applications. New York: McGraw Hill Education, International Edition 1990, Eleventh reprint 2018.	Questioning
	REVISION			