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 hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
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	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
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) (1 hour)	**Unit 2: Mapping by Elementary Functions** 2.4 Linear Transformations	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.	MCQ Test [15 marks] (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 (Day Order 1 to 6) (6 hours)	**Unit 3: Integrals** 3.3 Multiply Connected Domains 3.4 Cauchy Integral Formula 3.5 An Extension of the Cauchy Integral Formula	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.	Third Component Test [15 marks] (Unit 3 – Sections 3.1, 3.2)
Feb 3-8, 2025 (Day Order 1 to 6) (6 hours)	**Unit 3: Integrals** 3.6 Some Consequences of the Extension 3.7 Liouville's Theorem and the Fundamental Theorem of Algebra 3.8 Maximum Modulus Principle	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

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

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			