Teaching Plan (2019-2020)
Semester - VI

Name oftheCourse : Complex Analysis
Subjectcode : MC1761

No. of hours per week	Credit	Total No. of hours	Marks
6	5	90	100

Objectives

1. To introduce the basic concepts of differentiation and integration of complex functions.
2. To use these concepts in higher studies.

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	understand the geometric representation of complex numbers	PSO- 1	U
CO- 2	use differentiation rules to compute derivatives and express complex-differentiable functions as power series	PSO- 4	E
CO- 3	compute line integrals by using Cauchy's integral theorem and formula	PSO-3	E
CO -4	identify the isolated singularities of a function and determine whether they are removable, poles or essential	PSO-1	U
CO- 5	evaluate definite integrals by using residues theorem	PSO-8	E

Unit	Module	Topics	Lecture hours	Learning outcomes	Pedagogy	Assessment/ evaluation
I	1	Complex numbers – conjugation and modulus	5	To prove $\mathbb{C}$ is a field and some inequalities	Lecture	Assignment
	2	Geometrical representation of complex numbers and n^{th} roots of complex numbers	5	To find magnitude, argument and n^{th} roots of complex numbers	Lecture, Group discussion	Test
	3	Circles and straight lines – general equations and problems	4	To obtain necessary and sufficient condition for the concept inverse points and reflection points	Lecture	Quiz
	4	Regions in the complex plane - definitions and examples	2	To identify regions in $\mathbb{C}$	Lecture with PPT	Assignment
	5	The extended complex plane - definition and problems	2	To determine the point on the sphere that represents the complex plane	Lecture	Test
II	1	Differentiability – definitions and theorems	3	To analyse basic properties of differentiability	Lecture	Assignment
	2	Cauchy Riemann equations – theorems and examples, Alternate forms of C.R equations – theorems and	7	To get necessary & sufficient condition for differentiability	Lecture	Formative Assessment

		problems				
	3	Analytic functions – definition and problems	5	To discuss some properties of analytic function	Lecture	Test
	4	Harmonic functions – definitions, theorems and problems	7	To find analytic functions	Lecture with group discussion	Assignment
	5	Bilinear transformations – elementary transformation and cross ratio	7	To determine the image of given region under bilinear transformation	Lecture with PPT	Test
III	1	Definite integral – definitions, theorems and examples	4	To evaluate definite integral	Lecture	Assignment
	2	Cauchy's theorem – definition and theorems	5	To prove Cauchy's theorems	Lecture	Test
	3	Cauchy's integral formula – theorems and problems	5	To evaluate integrals	Lecture with group discussion	Test
IV	1	Taylor's series-	5	To expand given function as Taylor's series	Lecture	Assignment

		Taylor's theorem and problems			with group discussion	
	2	Laurent's Series – Laurent's theorem and problems	5	To expand given function as Laurent's series	Lecture	Formative Assessment
	3	Zeros of analytic functions – definition and problems	3	To determine zeros of analytic functions	Lecture	Assignment
	4	Singularities – definitions and examples	2	To find singularity of a given function	Lecture	Test
V	1	Residues –definition, lemmas and problems	5	To find residue of a given function	Lecture	Test
	2	Cauchy's residue theorem – theorems and examples	4	To evaluate given definite integrals	Lecture	Test
	3	Evaluation of definite integrals – method and problems	5	To evaluate given definite integrals	Lecture	Formative Assessment

Course Instructor (Aided): Dr. M. K. Angel Jebitha Mary Course Instructor (S.F): Ms. V. Pincy Kala

HoD (Aided): Dr. V.M. Arul Flower
HoD (Aided): Ms. J. Anne Mary Leema