

## TEACHING PLAN

<b>Course Title: Complex Dynamical Systems</b>	<b>Duration of Examination: 3 hours</b>
<b>Course Code: MAMT- 409</b>	<b>Maximum Marks: 100</b>
<b>Course Instructor's Name: Dr. Kamlesh Kumar</b>	
Lecture 1	Introduction to Mobius maps
Lecture 2	Iteration of a Mobius transformations and some examples
Tutorial 1	Assignment/ Discussion/Exercises
Lecture 3	Fixed points and some examples
Lecture 4	Types of fixed points as Attracting, repelling and indifferent
Tutorial 2	Assignment/ Discussion/Exercises
Lecture 5	Introduction to extended complex plane
Lecture 6	Stereographic projection and representation of complex numbers on a sphere
Tutorial 3	Assignment/ Discussion/Exercises
Lecture 7	Chordal metric and Spherical metric
Lecture 8	Theorems based on chordal and spherical metrics
Tutorial 4	Assignment/ Discussion/Exercises
Lecture 9	Introduction to Rational maps
Lecture 10	Lipschitz's condition
Tutorial 5	Assignment/ Discussion/Exercises
Lecture 11	Conjugate classes of rational maps
Lecture 12	Valence of function and some examples
Tutorial 6	Assignment/ Discussion/Exercises
Lecture 13	Critical points of rational maps
Lecture 14	Conjugacy of rational map to a polynomial
Tutorial 7	Assignment/ Discussion/Exercises
Lecture 15	d-fold map of a rational function
Lecture 16	Theorems based on number of fixed points for a rational map
Tutorial 8	Assignment/ Discussion/Exercises
Lecture 17	Introduction to Equicontinuous functions
Lecture 18	Maximality in rational functions
Tutorial 9	Assignment/ Discussion/Exercises
Lecture 19	Normality and its properties
Lecture 20	Definitions of Fatou and Julia sets
Tutorial 10	Assignment/ Discussion/Exercises
Lecture 21	Properties of Fatou and Julia sets
Lecture 22	Theorems based on Fatou and Julia sets

Tutorial 11	Assignment/ Discussion/Exercises
Lecture 23	Invariant maps and some theorems
Lecture 24	Completely invariants and its Properties
Tutorial 12	Assignment/ Discussion/Exercises
Lecture 25	Introduction to Exceptional points
Lecture 26	Backward orbit and its properties
Tutorial 13	Assignment/ Discussion/Exercises
Lecture 27	Exceptional points of rational maps
Lecture 28	Closure of Julia set and some theorems
Tutorial 14	Assignment/ Discussion/Exercises
Lecture 29	Derived sets of Julia set and some theorems
Lecture 30	Uncountability in Julia sets
Tutorial 15	Assignment/ Discussion/Exercises
Lecture 31	Periodic points and its properties
Lecture 32	Some theorems on periodic points
Tutorial 16	Assignment/ Discussion/Exercises
Lecture 33	Introduction to structure of Fatou set
Lecture 34	Some introductory topics on topology
Tutorial 17	Assignment/ Discussion/Exercises
Lecture 35	Definitions on Connectedness and disconnectedness
Lecture 36	Simply connected Fatou sets
Tutorial 18	Assignment/ Discussion/Exercises
Lecture 37	Components of Fatou sets of rational maps
Lecture 38	Completely invariant components
Tutorial 19	Assignment/ Discussion/Exercises
Lecture 39	Components of Julia sets
Lecture 40	Some theorems on components of Julia sets
Tutorial 20	Assignment/ Discussion/Exercises