

TEACHING PLAN

Course Title: Real Analysis	Duration of Examination: 3 hours
Course Code: MAMT- 107	Maximum Marks: 100
Course Instructor's Name: Mr. Kamlesh Kumar	
Lecture 1	Introduction to Euclidean space \mathbb{R}^n and its properties
Lecture 2	Open ball and open sets in \mathbb{R}^n
Tutorial 1	Assignment/ Discussion/Exercises
Lecture 3	Structures of open sets in \mathbb{R}
Lecture 4	Adherent and accumulation points and its properties
Tutorial 2	Assignment/ Discussion/Exercises
Lecture 5	Derived set and Closure of a set and its properties
Lecture 6	Bolzano's Weierstrass theorem, Cantor intersection theorem
Tutorial 3	Assignment/ Discussion/Exercises
Lecture 7	Lindeloff covering theorem, Heine-Borel theorem
Lecture 8	Compactness and its properties
Tutorial 4	Assignment/ Discussion/Exercises
Lecture 9	Introduction to Riemann-Stieltjes Integral (RSI)
Lecture 10	Conditions for the existence of RSI
Tutorial 5	Assignment/ Discussion/Exercises
Lecture 11	Properties of RSI, integration and differentiation
Lecture 12	Fundamental theorems of calculus
Tutorial 6	Assignment/ Discussion/Exercises
Lecture 13	Integration of vector valued functions
Lecture 14	Theorems based RSI for the vector valued functions
Tutorial 7	Assignment/ Discussion/Exercises
Lecture 15	RSI for the monotonic increasing/ decreasing functions
Lecture 16	RSI for the continuous functions
Tutorial 8	Assignment/ Discussion/Exercises
Lecture 17	Introduction to sequence of real valued functions
Lecture 18	Introduction to series of real valued functions
Tutorial 9	Assignment/ Discussion/Exercises
Lecture 19	Point wise and Uniform convergence for the sequence of the functions
Lecture 20	Cauchy's criterion for the uniform convergence
Tutorial 10	Assignment/ Discussion/Exercises
Lecture 21	Weierstrass M-test for the uniform convergence of the series of the functions
Lecture 22	Abel's and Dirichlet's tests for the uniform convergences of the sequence of real

	valued functions
Tutorial 11	Assignment/ Discussion/Exercises
Lecture 23	Uniform convergence and Continuity
Lecture 24	Theorems based on Uniform convergence and continuity
Tutorial 12	Assignment/ Discussion/Exercises
Lecture 25	Weirstrass approximation theorem
Lecture 26	Uniform convergence of differentiable functions and its properties
Tutorial 13	Assignment/ Discussion/Exercises
Lecture 27	Introduction to Power series
Lecture 28	Uniqueness theorem for Power series
Tutorial 14	Assignment/ Discussion/Exercises
Lecture 29	Radius of convergence of power series
Lecture 30	Abel's and Tauber's theorem
Tutorial 15	Assignment/ Discussion/Exercises
Lecture 31	Functions of bounded variation and its properties
Lecture 32	Variation function and its properties
Tutorial 16	Assignment/ Discussion/Exercises
Lecture 33	Function of several variables, linear transformation
Lecture 34	Directional derivative functions, chain rule
Tutorial 17	Assignment/ Discussion/Exercises
Lecture 35	Partial derivatives and interchange of the order of the differentiation
Lecture 36	Higher ordered derivatives and its properties
Tutorial 18	Assignment/ Discussion/Exercises
Lecture 37	Taylor's theorem, Inverse function theorem
Lecture 38	Implicit function theorem, Jacobians and its properties
Tutorial 19	Assignment/ Discussion/Exercises
Lecture 39	Extremum problems with constraints
Lecture 40	Lagrange multiplier method for the extremum value of the function
Tutorial 20	Assignment/ Discussion/Exercises