Semester	**III**
Course	**Major**
Paper Code	C2MT230311T
Paper Title	**Analysis-2**
No. of Credits	**4**
Theory / Practical / Composite	**Theory**
Minimum No. of preparatory hours per week a student has to devote	**4**
Number of Modules	Nil
Syllabus	Continuity of a function **[28]:** Continuous functions, sequential criterion of continuity and discontinuity **(4)**; Algebra of continuous functions (2) Statement and proof of properties of continuous functions defined on closed and bounded intervals: boundedness, attainment of bounds, Bolzano's theorem **(6)**; Intermediate value property & allied results, fixed points of continuous functions. Set of discontinuities of monotone functions, continuous injective functions are strictly monotone, converse of IVP **(5)**. Uniform continuity, non-uniform continuity criterion, functions continuous on a closed and bounded interval is uniformly continuous, Lipschitz condition and uniform continuity **(6)** Continuous extension theorem, monotone and inverse functions, inverse function theorem **(5)** Introduction to Derivative [24]: Concept of differentiability of a function at a point and in an interval, Caratheodory's theorem, chain rule, sign of derivative**(3)**;Algebra of differentiable functions; Relative extrema, interior extremum, point extremum**(3)** ; Successive derivative: Leibnitz theorem and its applications**(2)** ;Rolle's theorem, Meanvalue theorems, Darboux theorem, fixed points of differentiable functions; Cauchy's mean value theorem**(5)**,Taylor's theorem with

	Lagrange's and Cauchy's form of reminder; Application of Taylor's theorem to convex functions ,relative extrema**(5)**;Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions**(4)**. Indeterminate forms: L.Hospital's rule and its applications**(2)**	
Learning Outcomes	• Learning the concept of Calculus namely limit, continuity and differentiability of real valued functions defined on an arbitrary subset of the set of real numbers. • Using the sequential method in the study of Calculus. • Learning the salient properties of continuous functions defined on intervals. • Learning the salient properties of differentiable functions, extreme value and series expansion of differentiable functions.	
Reading/Reference Lists	(1) Introduction to Real Analysis: Bartle and Sherbert (2) Calculus and Mathematical Analysis:S. Goldberg (3) Principles of Mathematical Analysis:W. Rudin (4) Real Analysis: Shanti Narayan (5) Real Analysis: S.K.Mapa	
Evaluation	70	30
Paper Structure for Theory Semester Exam	7 questions each carrying 10 marks needs to be answered out of 12/13 questions.	