

Semester	AUG 2022
Open to semester	1
Course code	MT1113
Course title	Calculus - I
Credits	3 /
Course Coordinator & participating faculty (if any)	Krishna Kaipa*, Manish Mishra
Nature of Course	Lectures and Tutorials
Pre-requisites	None.
Objectives (goals, type of students for whom useful, outcome etc)	This course introduces the basic tools of calculus of functions of one variable. We develop the concepts of continuity, differentiability and integrability together with their geometric and physical meaning. Along with this, we also introduce the key techniques of mathematical proofs like induction and contradiction. This opens up our awareness of the logic underlying the world of mathematics, and brings clarity to our study. Applications include computing extrema of functions and calculating areas of regions bounded by graphs. This course will be useful to all students irrespective of the science discipline they will pursue in their program.
Course contents (details of topics /sections with no. of lectures for each)	Set and functions, Mathematical induction, finite and infinite sets, proof by contradiction, properties of real numbers, least upper bound axiom, convergent sequences, limits of functions, continuity, intermediate value theorem, differentiability, product and chain rules, mean value theorem, Taylor's Theorem and Taylor's Expansion, maxima and minima, series, Riemann integration, fundamental theorem of calculus, integration by parts and change of variables, applications to area and volume, First and second order linear ODE with constant coefficients: Methods of solving, statement of existence and uniqueness of solutions (without proof).
Evaluation /assessment	End-Sem Examination-40% Mid-Sem Examination-40% Others-Quizzes : 20% %
Suggested readings (with full list of authors, publisher, year, edn etc.)	1. Calculus Vol. 1 and 2: T .M. Apostol (2007) Wiley 2. Calculus: M. Spivak (2006) Cambridge 3. Calculus: J. Stewart (2012) Cengage Learning

	4. Calculus and Analytic Geometry: G.B. Thomas, R. Finney (1995) Addison-Wesley
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