



**Department of Mathematics**  
**Faculty of Sciences, Jamia Millia Islamia**

**U. G. Minor Papers in Mathematics**  
**(2024-25)**  
**Course Structure and Syllabus**

Semester	Code	Title of the Paper	Credit
I	BMMIN-11	Basic Calculus	4

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Unit-I	Function, limit of a function, algebra of limits. Continuity and Differentiability of a function, Successive differentiation, Leibnitz theorem, Rolle's Theorem, Mean value theorems (without proof).
Unit-II	Taylor's and McLaurin's series, Maxima and minima of a function of one variable, Indeterminate form, Curvature; Cartesian, polar and parametric formulae for radius of curvature.
Unit-III	Partial derivatives, applications of partial derivatives, Euler's theorem on homogeneous functions, Asymptotes, Test of concavity and convexity, Points of inflexion, multiple points. Tracing of curves in Cartesian and polar coordinates.
Unit-IV	Integral of irrational and trigonometric functions, properties of definite integrals, Reduction formulae, Quadrature, Rectification, Volumes and surfaces of solids of revolution.

**Books Recommended**

1. Howard Anton, Calculus, John Wiley & Sons, 2012.
2. George B. Thomas, Ross L. Finney, Calculus 11Ed., Pearson Education, 2008.
3. Gorakh Prasad: *Differential Calculus*, Pothishalas Pvt Ltd, Allahabad.
4. Shanti Narayan: *Differential Calculus*, S. Chand & Co.
5. Shanti Narayan: *Integral Calculus*, S. Chand & Co.
6. Khalil Ahmad: *Text Book of Calculus*, World Education Publishers, 2012.